TABLE OF CONTENTS

SECTION 01010

GENERAL PROJECT DESCRIPTION AND GENERAL DESIGN REQUIREMENTS

GENERAL PROJECT DESCRIPTION AND GENERAL DESIGN REQUIREMENTS

1. DESIGN OBJECTIVES.

1.1. General Requirements. The design and technical criteria contained or referenced in this Request For Proposal (RFP) constitute the minimum requirements of the Government for the subject project, hereinafter referred to as "the WBR project". The WBR project renovates Quadrangle F, hereinafter referred to as "Quad F". Quad F consists of four buildings: Bldg. 649, Bldg. 650, Bldg. 651, and Bldg. 652. The exterior appearance of the WBR project shall be designed and constructed to be architecturally compatible with the other quadrangles at Schofield.

1.2. Objectives. This solicitation seeks to obtain renovation, alteration, and construction work of Quad F that is complete and adequate for Unaccompanied Enlisted Personnel Housing (UEPH), administrative facilities, an Enlisted Dining Facility and a Soldier Community functions. See Table 1-1 for a building summary. The WBR project also includes site redevelopment of supporting facilities.

1.2.1 Unaccompanied Enlisted Personnel Housing. The UEPH concept is to provide privacy, security, and comfort to the soldier to the extent possible. The minimum number of persons to be accommodated in this project is 300 sleeping rooms at the E2 through E4 grade level.

1.2.2. Administrative Facilities.

1.2.2.1. Battalion Headquarters. Space will be provided for a command section, S-1/PAC, S-2, S-3, S-4, chaplain and assistant chaplain, classroom, and service core. A Battalion Headquarters standard design is included in this solicitation as a reference to adapt the design into an existing building. Designs will be based on the functional relationships of the design standard. Battalion Headquarters will be designed for physically handicapped individuals.

1.2.2.2. Brigade Headquarters. Space will be provided for a command section, S-1, S-2, S-3, S-4, service core and support services including a Troop Aid Station. A Brigade Headquarters standard design is included in this solicitation as a reference to adapt the design into an existing building. Designs will be based on the functional relationships of the design standard. Brigade Headquarters will be designed for physically handicapped individuals.

1.2.2.3. Company Operations Facility. Space will be provided for Administrative functions: private offices, open administration floor area, conference room, classroom, entry, waiting area, janitor's closet, storage, and toilet facilities. Space will be provided for Operations functions: arms vault, communications storage, equipment maintenance, information management systems room, Nuclear, Biological and Chemical (NBC) equipment storage, unit storage, general storage, TA-50 gear storage, and showers. A Company Operations Facility standard design is included in this solicitation as a reference to adapt the design into an existing building. Designs will be based on the functional relationships of the design standard. Company Operations Facility will not be designed for physically handicapped individuals.

1.2.3. Enlisted Personnel Dining Facility (DFAC). The existing dining facility will be renovated and expanded to meet the new requirements. The major functional areas to be provided in the DFAC are dining, dish washing, employee lockers and toilets, food preparation and cooking, garbage and trash disposal, non-provision storage, patron toilets, staff office, pot and pan washing, receiving platform, refrigerated and dry storage, serving, and signature-head count, cashier station(s), and staging area. An Enlisted Dining Facility standard design is included in this solicitation as a reference to adapt the design into an existing building. Designs will be based on the functional relationships of the design standard. The DFAC will be designed for physically handicapped individuals.

1.2.4. Soldier Community Functions (SCB). The SCB provides the soldier with social gathering areas including a kitchen, recreational space and meeting space. Space will be provided for laundry rooms,

mail room with mail boxes, and a social activity room. A SCB standard design is included in this solicitation as a reference to adapt the design into an existing building.

Table 1-1 shows the location the functional areas of the 4 Quad F buildings:

TABLE 1-1 QUAD F Building Work

Building Functions	Bldg. 649			Bldg. 650			Bldg. 651			Bldg. 652		
	1st Flr	2nd Flr	3rd Flr	1st Flr	2nd Flr	3rd Flr	1st Flr	2nd Flr	3rd Flr	1st Flr	2nd Flr	3rd Flr
Unaccompanied Enlisted Housing							♦	♦	♦	♦	♦	♦
Brigade Headquarters		♦										
Battalion Headquarters			♦									
Battalion Headquarters Troop Aid Station	♦											
Battalion Headquarters Classrooms						♦						
Company Operations Facility Administrative Areas			♦		♦							
Company Operations Facility Maintenance Area & Arms Vault	♦											
Company Operations Facility Gear Wash Area							♦			♦		
Enlisted Personnel Dining Facility				♦								
Soldier Community Building Laundry Rooms							♦	♦	♦	♦	♦	♦
Soldier Community Building Mail Room & Mail Boxes				♦								
Soldier Community Building Social Activity Area				♦								

1.2.5. Miscellaneous Facilities.

1.2.5.1. Covered Gear Wash/Recreational Area. A new covered gear wash and recreation facility shall be constructed within the quadrangle courtyard. The primary function of the facility is to provide an area for washing and cleaning soldier personal gear (TA-50). This facility will also co-function as an outdoor recreational area for social gatherings. The recreational area shall include built-in barbecue pits, sink, and tables to accommodate one (1) Company sized gathering. A Company Operations Facility standard design is included in this solicitation as a reference to adapt. Designs will be based on the gear wash functional area requirements of the design standard.

1.2.5.2. Multi-Purpose Playing Court. The existing multipurpose court shall be demolished and reconstructed. The new courts shall consist of basketball and volley ball play areas. Court markings shall meet National Collegiate Athletic Association (NCAA) and United States Volleyball Association (USVBA) standards. Court shall also include pedestrian walkways, lighting and water fountain(s). Typical multi-purpose playing court details are included in this solicitation as reference to adapt.

1.2.5.3. Bicycle Racks. New bicycle racks shall be constructed within the quadrangle courtyard area. The
Each bicycle rack shall consist of a concrete pad and permanently install racks. Racks shall also include a concrete ramps as required to permit safe egress.

1.2.6. Site Redevelopment. In addition to the renovation of the existing Quad F buildings and the construction of the above miscellaneous facilities, this project will include site redevelopment of the quadrangle complex and surrounding facilities. Site redevelopment will include reconstructing or resurfacing existing access drives, parking areas and pedestrian walkway to provide safe pedestrian and vehicle circulation and meet Antiterrorism/Force Protection requirements. Redevelopment scope will also include upgrading storm drainage and utility systems as well as landscaping to support the complex. The site redevelopment will include the following:

1.2.6.1. Civil Design.

1.2.6.1.1 Demolition. Existing pavement, curbs, gutters, pedestrian walkways, storm drainage and utility systems (water, sewer, electrical distribution, communication, etc.) shall be demolished and removed as required to accomplish the site redevelopment scope.

1.2.6.1.2 Antiterrorism/Force Protection (AT/FP). The quadrangle facilities shall be upgraded to be in compliance with AT/FP design and construction standards. Improvements include realigning Foote Avenue from Glennan St. to Meigs Avenue, installing vehicular entrance control barriers, relocating parking areas and trash enclosures and removing landscaping. Foote Avenue realignment work will include removing and reconstructing pavement, curbs, gutter, sidewalks, pavement marking, signage, utilities, and storm drainage and landscaping. (Note that final AT/FP improvement scope is pending results of an ongoing AT/FP Study. The results of the study will be provided to the offerors.)

1.2.6.1.3 Grading and Storm Drainage. The existing quadrangle storm drainage systems (drain lines, curb inlets, manholes, etc.) shall be removed and replaced (unless otherwise indicated or approved) with upgrade systems to meet current design and construction standards.

1.2.6.1.4 Water and Sewer System. The existing water and sewer systems servicing the existing quadrangle facilities shall be removed and replaced (unless other wise indicated or approved) with upgrade systems to support renovated and new facility service requirements and to meet current design and construction standards.

1.2.6.1.5 For Civil Design requirements, see Subsection 2, General Design - Civil

1.2.6.2 Mechanical Design - Site Redevelopement. The existing underground chilled water lines within the quandrangle complex shall be removed and replaced with upgraded systems to support the renovated and new facilities and meet current design and construction standards. Also, underground chilled water lines that feed Quad E shall be removed and replaced with upgraded systems up to Lewis Street. For exterior mechanical design requirements, see Subsection 5, General Design - Mechanical.

1.2.6.3 Electrical Design - Site Redevelopment. The existing exterior systems (electrical power, lighting, telecommunication, cable tv, etc.) servicing the existing quadrangle facilities shall be removed and replaced (unless other wise indicated or approved) with upgrade systems to support renovated and new facility service requirements and to meet current design and construction standards. For exterior electrical design and construction requirements, see Subsection 7, General Design - Electrical.

1.2.6.4 Landscape Design - Site Redevelopment.

1.2.6.4.1 Design Theme. The landscaping design theme shall incorporate preserved trees and as well as use of native plants, emphasis of building entry points and sense of community. Siting of new facilities shall provide adequate space for trees such that the trees continue to be a valuable asset to the housing community.

1.2.6.4.2 Removal and Preservation of Existing Trees. Scope will include removal of designated trees within the Quad F and surrounding areas. Saved trees shall be protected during demolition and construction activities. Existing trees identified for saving in the Tree Removal and Preservation Plan shall be an integral feature of the site plan. Project design and construction practices shall avoid altogether or minimize construction impacts on saved trees to ensure their long term survival, health, and structural stability.

1.2.6.4.3 Use of Recycled Materials. The approach and plan shall design shall include the use of recycle-content materials, recycling of plant material (tee stumps, and brush) and water conservation.

1.2.6.4.4 For landscape design requirements, see Subsection 9, General Design - Landscape.

1.3. Special Requirements.

1.3.1. Historical Preservation.

1.3.2. Comprehensive Interior Design (CID). The Comprehensive Interior Design is composed of two types of interior design requirements. The first is the building-related interior finishes of walls, ceilings, floor coverings, built-in casework, etc. This is defined as the BID or Building Interior Design. This is the responsibility of the Offeror. The second requirement is the design coordination of interior furnishings and equipment related to the building-related interior finishes. This second requirement is hereinafter referred to as “FID”. CID services will be provided by the Offeror.

1.3.2.1. Completion of a FID involves the selection and sampling of the furnishings components of the interior environment in addition to the building-related interior finishes. This may include furniture systems, freestanding furniture, artwork, and accessories. The FID package will include furniture placement plans, information on all freestanding furnishings and accessories, furniture cost estimates, and order daa sheets. The procurement and placement of the FID products and materials are the responsibility of the Government. The Comprehensive Interior Design requirements and format information is found in the Appendix.

1.3.2.2. In addition to providing a CID package for the dining facility (DFAC). A list of category C food service equipment shall be provided. Class C Equipment is movable in nature and not affixed or built into a DFAC as an integral part of the facility. Because this equipment is the responsibility of the Government, the Offeror must provide the Class C equipment list, description, and cost to ensure the equipment is requisitioned and delivered on site prior to the building occupancy. A 501-800 Enlisted Personnel Dining Facility standard design is referenced in this solicitation. It includes a typical category C food service equipment list.

1.3.2.3. Comprehensive Interior Design (CID) is required for all of the buildings.

1.3.3. Antiterrorism/Force Protection (AT/FP) and Seismic Evaluation and Rehabilitation. Design of this project shall incorporate minimum AT/FP construction standards and required seismic rehabilitation techniques to strengthen the Quad F buildings. See Subsection 4, GENERAL DESIGN - STRUCTURAL, for information on on-going assessments and studies of AT/FP and seismic requirements, and instructions on incorporating retrofits and rehabilitation measures in the price proposal. See also Subsection 2, CIVIL DESIGN, for site upgrades required for AT/FP.

1.4. Design Freedom. Requirements stated in this RFP express the minimum acceptable standards or features which the Government will accept in any proposal submitted. Design and maintainability/quality parts of proposals containing standards or features that exceed (in terms of innovation, creativity or cost-savings) the minimum acceptable standards contained herein shall be considered more advantageous to the Government than design and maintainability/quality parts of proposals that contain standards or features that do not, and may earn the offer a higher quality score for design and maintainability/quality (up to the maximum quality score allowable for those parts of the proposal) than an offer containing

merely the minimum required standards or features. Deviations from space and adjacency requirements will not generally be favorably evaluated by the Government unless the change results in improvement to the facilities.

1.5. Design Quality. The objectives are to obtain renovated structures and complementary site development within funds available and to optimize livability and functionality. Design quality is achieved through the optimization of interior planning, integration of the Quad F structures to the site and its natural resources such as existing trees, solar orientation, and balancing architectural attractiveness, sustainable design features, function, and design for low-cost maintenance and operation of the buildings.

1.6. Installation Master Plan. The installation master plan provides comprehensive documentation of the existing conditions of natural, man-made and human resources. It also guides the future land-use development. The master plan should be consulted as it is the mechanism for ensuring that individual projects are sited to meet overall installation goals and objectives for land use development. This can be viewed at Rm. 319C, Bldg. 230, Engineering Services Division, Ft Shafter, Oahu, Hawaii.

1.7. Installation Exterior Architectural Plan (IEAP). Design of this project shall incorporate the design guidance and criteria contained in the IEAP, if no specific guidance/requirements are discussed in the RFP. This can be viewed at Rm. 319C, Bldg. 230, Engineering Services Division, Ft Shafter, Oahu, Hawaii.

1.8. Sustainable Design Features. Public Law 102-486, Executive Order 13123, and Federal Regulations 10 CFR 435, require Federal buildings to be designed and constructed to reduce energy consumption in a life-cycle, cost-effective manner using renewable energy sources when economical. Products designed to conserve energy and resources by controlling the amounts of consumed energy or by operating at increased efficiencies should be considered. Minimum requirements for this project are energy conservation fixtures, window glazing, solar panels or heat pump water heater, time switches, and water flow-limiting plumbing fixtures.

2. CIVIL DESIGN - SITE REDEVELOPMENT.

2.1 Scope. The civil design site redevelopment scope consists of, but not limited to, demolition and clearing; site layout of the covered gear wash/recreation facility, multi-purpose playing court, bicycle racks, trash enclosure, and realigned Foote Avenue. (Site and layout requirements include meeting current Antiterrorism/Force Protection requirements.) In addition, the scope also includes reconstructing and upgrading access drives, parking, and pedestrian walks, storm drainage, water and sewer systems to support renovated quadrangle facilities and meeting current design and construction standards.

2.2 Reference Requirements and Standards.

2.2.1. Army/Military Construction Criteria. Unless otherwise noted, the following criteria is available via the internet at;

http://www.hnd.usace.army.mil/techinfo/index.htm

2.2.1.1. U.S. Army Corps of Engineers Technical Instructions, TI 800-01, Design Criteria, 20 July 1998.

2.2.1.2. U.S. Army Corps of Engineers Technical Instructions, TI 804-11, Design for Non-Organizational or Privately Owned Vehicle (POV), Site Circulation and Parking, November 1998.

2.2.1.3. U.S. Army Corps of Engineers Technical Instructions, TI 814-10, Wastewater Collection, 3 August 1998

2.2.1.4. Army Technical Manual, TM 5-813-5, Water Supply, Water Distribution, November 1996 (Attached in RFP)

2.2.1.5. Military Handbook, MIL-HDBK 1008C Fire Protection for Facilities Engineering, Design, and Construction, dated 10 June 1997, may be obtained at the Corps of Engineers Huntsville Engineering and Support Center web site under “Techinfo”. The web site address is http://www.hnd.usace.army.mil/.

2.2.1.6 Interim Department of Defense Antiterrorism/Force Protection Construction Standards, (For Official Use Only, not available for viewing or download)

2.2.2. City and County of Honolulu Design Standards. The following references are available for purchase from the City and County of Honolulu Municipal Book Store, 558 South King Street, City Hall Annex, Honolulu, HI 96813, Phone: (808) 523-4780. Information on how to purchase and order publications is available via the internet at;

http://www.co.honolulu.hi.us/pur/booklist.htm

2.2.2.1. Rules Relating to Storm Drainage Standards, Department of Planning and Permitting, City & County of Honolulu, January 2000.

2.2.2.2. The Department of Public Works, Standard Specifications for Public Works Construction, City and County of Honolulu, Sept. 1986.

2.2.2.3. The Department of Public Works, Standard Details for Public Works Construction, City and County of Honolulu, Sept 1984.

2.2.3. U.S. Department of Transportation, Federal Highways Administration. The following document shall be used for road and street design: The Manual On Uniform Traffic Control Devices For Streets and Highways. It is available from the Superintendent of Documents, U.S. Government Printing Office, Washington D.C. 20402.

2.2.4. Americans with Disabilities Act Accessibility Guidelines (ADAAG). Available from U.S. Architectural and Transportation Barriers Compliance Board, Suite 1000, 1331 F Street, N.W., Washington, D.C. 20004-1111 (202) 272-5434.

2.2.5. American Water Works Association, Inc. (AWWA). Specifications are available from AWWA, 6666 Quincy Ave., Denver, CO 80235; voice: 800-926-7337; fax: 303-795-1989: http://www.awwa.org/. AWWA standards called for the standards of the Board of Water Supply, City and County of Honolulu, the following apply: AWWA C907 PolyVinyl Chloride (PVC) Pressure Fittings for Water - 4 Inch Through 8 Inch (100 mm Through 200 mm).

2.2.6. Draft Report Prepared by Belt Collins Hawaii, Ltd., FY96 OMA Family Housing Master Plan and Infrastructure Study, Army Storm Drainage Infrastructure Study Vol. I and II, For Schofield Barracks, March 2001. Copy is available for review at Honolulu District, Bldg. 230, Technical Review Section, Rm. 225.

2.3 Demolition.

2.3.1. Designated demolition limits are indicated on the attached RFP drawings entitled DEMOLITION PLAN-1, -2 and -3.

2.3.2. Existing utilities within the project limits shall be adjusted, relocated or modified as required to remain functional. The Contractor shall coordinate all utility adjustment work with the appropriate utility agencies/departments. The area within the project limits, which does not involve new construction, shall be graded smooth to drain, and planted with grass. All existing walks, parking and streets, drainage and utility systems at the interface with the demolition shall be properly coordinated and new construction provided for the continued functionality, operation and maintenance of adjoining and remaining facilities and systems. All existing utility structure and related appurtenances, which will not be utilized in the project shall be removed and disposed of. Abandonment in-place shall not be permitted unless removal of underground utilities requires excavation within the tree protection zone of the existing trees to be saved. Unless otherwise noted, demolition work shall include the removal and disposal of:

2.3.2.1 Existing Multipurpose Playing Court and trash enclosure and appurtenances.

2.3.2.2 Walks, paved aprons, driveways, parking areas and streets to include curbs and gutters; drainage structures, pipes and culverts.

2.3.2.3 Water, sewer, electrical, telephone, and CATV utilities to include poles, wire, anchors, and underground pipes, conduits, wires, and other appurtenances.

2.3.2.4 Trees not identified for saving or transplanting. For tree removal and preservation requirements, see Subsection 9, General Design - Landscape. For location of trees designated for removal and preservation, see RFP drawings.

2.3.2.5 Shrubs.

2.3.2.6 Landscaping appurtenances to include any irrigation systems.

2.3.3 Disposal of debris and waste material shall be outside the limits of Government property, and shall be the contractor's responsibility. The contractor may at his option dispose of trees and shrubs by chipping the green waste and applying the material as a mulch layer 100 to 150 mm (4 to 6 in.) thick over bare ground surfaces of training grounds at Schofield Barracks to control soil erosion. The location of this material disposal site will be determined by the Director of Public Works, Schofield Barracks.

2.3.4 Construction and Demolition (C&D) Waste. The Offeror is required to submit for government approval a detailed C&D plan after the award of the contract. The purpose of the plan is to minimize the generation of C&D waste, and ensure that the maximum amount of C&D waste (including materials

generated during the clearing of the site, interior demolition of existing structures, and new construction activities) is salvaged for resale or reuse, returned, or is recycled. This plan does not include hazardous waste (any waste substance, which is ignitable, corrosive, reactive, or toxic that, if improperly handled, poses a substantial threat to human health and/or environment).

2.4 Site Layout.

2.4.1. General. The design after award drawings shall indicate the location of the covered gear wash/recreation facility, multi-purpose playing court, bicycle racks, trash enclosure, realigned Foote Avenue access drives, parking, pedestrian walks, and trash enclosure, bike rack, storm drainage, water and sewer systems. Additional items of consideration in siting the facilities will be; antiterrorism/force protection, aesthetics, environmental requirements, safety, and convenience for vehicles and pedestrians.

2.4.2 Covered Soldier Gear Wash/Recreational Facility.

2.4.2.1 Location and Orientation. The approximate location of the gear wash/recreation facility is indicated on the attached RFP drawing entitled, SITE REDEVELOPMENT REQUIREMENTS-1, Sheet C-1. The designer shall coordinate with the government to determine the exact size, location and orientation after award.

2.4.2.2 Size. The approximate size of the facility indicated on the RFP drawing is intended for budgeting purposed only. Designer shall coordinate with the government after award to determine the overall facility size.

2.4.2.3 Utilities. Water, sewer, and electrical service shall be provided.

2.4.2.4 Gas Trap. A gas trap shall be provided to prevent sewer gases from migrating back into the trench drainage system. The gas trap shall include a settling basin to capture, separate and remove soil and debris prior to discharge into the sanitary sewer system. For typical gas trap detail, see Attachment, Typical Gas Trap Detail. (Note that detail is provided for informational purposed only. Contractor is responsible for verifying accuracy of dimensions.)

2.4.3 Multi-Purpose Playing Court.

2.4.3.1 Location and Orientation. The approximate location of the multipurpose court is indicated on the attached RFP drawing entitled, SITE REDEVELOPMENT REQUIREMENTS-1, Sheet C-1. The designer shall coordinate with the government to determine exact location and orientation preferred after award.

2.4.3.2 Size. Ground space shall consist of a minimum area of (approximately 915 sm (9,840 SF)) with overall dimensions of 36.6 m (120 ft) and an overall width by of 25-m (82 ft).

2.4.3.3 Pavement. Surface shall be bituminous material with concrete curbing along edge with a protective color coating. Typical pavement section shall consist of 100% compacted subgrade, 100% compacted 150 mm (6-inch) base course, 51mm AC surface course with protective color coating (at manufacturer's recommended rate) and 150mm x 300mm reinforced concrete curbing. For additional pavement requirements, see paragraph entitled, "Soils, Pavements and Earthwork ". Typical Multipurpose Court and Striping Details (sheet C-4) are provided in RFP drawings for Contractor to adapt for site-specific requirements.

2.4.3.4 Water Fountain. Multipurpose Courts will include one (1) water fountain (two (2) desirable). Fountain design shall blend in with historic theme of quadrangle facilities. Fountain location shall consider sports safety. Contractor shall coordinate exact location with the Government.

2.4.3.4 Utilities. Water and electrical service shall be provided.

2.4.4 Bicycle Rack.

2.4.4.1 Location and Orientation. The approximate location of the bicycle racks are indicated on the attached RFP drawing entitled, SITE REDEVELOPMENT REQUIREMENTS-1, Sheet C-1. The designer shall coordinate with the government to determine exact location and orientation preferred after award.

2.4.4.2 Size. Ground space for each rack shall be sufficient to accommodate a minimum of 20 bicycles.

2.4.4.3 Utilities. Lighting shall be provided for security and safety requirements.

2.4.5 Trash Enclosure.

2.4.5.1 Location and Orientation. The existing trash enclosure shall be demolished, relocated and replaced with an aesthetically pleasing enclosure. The enclosure shall be accessible by wheeled trash container. Trash enclosures with hinged, securable closures are preferred to “open” enclosures. The approximate location of the trash enclosure is indicated on the attached RFP drawing entitled, SITE REDEVELOPMENT REQUIREMENTS-1, Sheet C-1. The designer shall coordinate with the government to determine exact location and orientation preferred after award. The location shall meet AT/FP stand off requirements. For AT/FP requirements, see paragraph below entitled, “Antiterrorism/Force Protection (AT/FP) Civil Design Requirements”. Location shall also consider odor and prevailing wind direction.

2.4.5.2. Size. Overall dimensions of pad and enclosure shall match the existing. Approach drives to trash enclosure shall be concrete and should have sufficient length to accommodate the largest trash pick vehicle without obstructing the adjacent driveway. The enclosure access driveway width shall be equal to the width of the concrete pad.

2.4.5.3. Utilities. Provide hose bib and water service to permit wash down of the enclosure.

2.4.6 Antiterrorism/Force Protection (AT/FP) Requirements.

2.4.6.1. General. The site layout of existing and new quadrangle facilities shall be designed to meet Interim DOD AT/FP design and construction standards. (Note: For AT/FP Structural Requirements, see Subsection 4, General Design-Structural.)

2.4.6.2. Project Specific Requirements. The project specific AT/FP design and construction requirements are currently being assessed by an independent Government study. The results of the study will be provided to the Offerors as an amendment to the RFP. The following preliminary project specific requirements are pending the final results of the study.

2.4.6.2.1. Parking and Roadways. Locate parking lots at least 10 m (30 ft) from troop billeting and primary gathering structures. The standoff distance is measured from the nearest edge of pavement. Portions of buildings with lesser occupancies may be located within the standoff distance. (For definition of occupancies, see Interim Department of Defense (DOD) Antiterrorism Force Protection Minimum Construction.)

2.4.6.2.2. Relocated existing trash enclosure at least 25 m (82 ft) from troop billeting (this includes Unaccompanied Enlisted, and primary gathering structures (this includes Brigade HQ, Battalion HQ, Soldier Community, Company Operations, Dining Facility).

2.4.6.2.3. Provide post and chain with locks at each driveway access entrance and exit to provide a means to control vehicle access into the quadrangle courtyard area.

2.4.6.2.4 Provide signage to clearly define vehicle drive-up or drop off areas within the quadrangle to control type of traffic authorized within the quadrangle. (E.g. DO NOT LEAVE VEHICLES UNATTENDED, NO TRUCKS ALLOWED WITHOUT AUTHORIZATION, etc.)

2.4.6.2.5. Realign Foote Avenue shall be realigned from the intersection of Glennan Street to Meigs Avenue. The roadway shall be realigned to provide no less than 4.6-m (15-ft) setback from Quad F, E, D and C buildings to the nearest roadway edge (or traffic face of curb). For approximate limits and location of Foote Avenue realignment work, see attached RFP Drawing Sheet C-1.

2.4.6.2.6 Provide Visual Clear Zone around all Buildings. Avoid conditions within 9.15 m (30 ft) of troop billeting and primary gathering structures that permit concealment of aggressors or that would obscure the view of objects or packages 150 mm (6-inch) in height from view of security personnel. Utility pads for air handlers, transformers, etc., can be placed within the standoff distance if they do not provide access by unauthorized personnel by entering the structure or placing an object within it. This would require a locking enclosure with a roof or similar cover. Landscaping can be placed within the standoff distance only if the vegetation does not obscure an object 150 mm (6-inch) high from the view of the building occupants or those in the immediate surrounding area. For additional landscaping design AT/FP requirements, see Subsection 9, Landscape Design.

2.4.6.2.7 Court Yard Driveway. Courtyard driveway shall be realigned to provide a no less than 9.15m (30 ft) set back from existing quadrangle buildings. Existing pavement structure including curbing shall be replaced. The space between the closest pavement edge and quadrangle buildings shall landscaped.

2.4.7. Circulation, Roads and Parking.

2.4.7.1 General. The separation of vehicular and pedestrian traffic design shall be in accordance with TI 5-804-11, Design for Non-Organizational or Privately Owned Vehicle (POV), Site Circulation and Parking. The vehicular and pedestrian circulation system shall promote safe, efficient movement of vehicles and pedestrians within the quadrangle, adjacent parking lots and adjacent roadways. It should maintain the maximum separation of vehicles and pedestrians. Safe circulation systems shall have a clear hierarchy of movement, lead to a clear destination and do not interrupt other functions. In addition, The following criteria shall be considered for designing streets and drives for vehicles and pedestrians.

2.4.7.2 Pedestrian circulation. Pedestrian circulation should be safe and relate to the open area defined by the four quadrangle buildings, parking and community facilities. Pedestrian circulation should be based on pedestrian desired lines of walking between facilities. Desired lines should be weighted to predict the most traveled routes.

2.4.7.2.1 Quadrangle Pedestrian Walkways. Walkways shall be provided for the quadrangle complex. Walks, expect for building front entry, shall be a minimum of 1,830 mm (6 ft) wide exclusive of curb width, and made of non-reinforced concrete, minimum thickness of 100-mm (4 inches), with welded wire mesh fabric (0.05 percent steel in both directions). Front entry sidewalks shall be 3 m (10 ft) wide. Where walks are adjacent to the curb, the curb width is not to be included as sidewalk. Concrete walks shall be constructed in accordance to UFGS Section 02770a, CONCRETE SIDEWALKS AND CURBS AND GUTTERS, dated March 1998.

2.4.7.2.2. Provisions for Handicapped. Ramps and parking spaces for the handicapped shall be provided in accordance with the latest edition of the Uniform Federal Accessibility Standards (UFAS). Handicap access is required at the Dining Facility. Ramps for handicapped individuals shall also be provided at all intersections and wherever an accessible route crosses a curb. A separate handicapped ramp is required for each crosswalk. Sidewalks shall be widened when necessary to meet ramp slope criteria. Ramps for handicapped individuals shall follow City and County of Honolulu, Standard Detail R-25, dated September 1992 or later. Walks around the ramps shall be continuous, level and extend at least 1.22 m (4 ft) beyond the ramp unless otherwise approved in writing.

2.4.7.3. Roads and Parking

2.4.7.3.1 Realign Foote Avenue. Foote Avenue modifications includes reconfiguring the roadway section from a two-lane one-way operation to a one-lane one-way operation, upgrading drainage system, relocating street lighting and providing new sidewalks, traffic signs, pavement marking and landscaping. The following Table 2-1, lists the typical required minimum dimensions:

TABLE 2-1 - REALIGNED FOOTE AVE. MINIMUM STREET DIMENSIONS*

Travelway Width (Excluding Gutter)	3.65 m	12 ft
Minimum Curb Radius at Street Intersections	12.2 m	40 ft
Gutters Width	.610 m	2 ft
Curb Height	0.150 m	0.5 ft
Sidewalk (not including curb width)	1.2 m (1.5 m desirable) See Typical Section*	4 ft (5ft desirable) See Typical Section*
Landscaping Strip (North side /South Side)	See Typical Section*	See Typical Section*

* For typical road section, see Attachment, Foote Avenue Typical Road Section.

2.4.7.3.2 Quadrangle access driveways and Courtyard Drive.

2.4.7.3.2.1 The access drives curbing and pavement structure shall be removed and reconstructed. The existing dimensions, alignment, turning radius shall remain, except that access drives off of Foote Avenue shall be extended as required to maintain access to the realigned Foote Avenue.

2.4.7.3.2.2 Courtyard driveway area shall be reconfigured to meet AT/FP stand off requirements. See paragraph above.

2.4.7.3.3. Privately Owned Vehicle (POV) Parking. POV spaces shall be a minimum of 2.75m by 5.5m (9 ft by 18 ft). Parking aisles shall be minimum 7.5m (24 ft.). Island widths shall be minimum 3 m (9 ft). Parking stall fillets shall be minimum 1 m (3 ft). For all other parking, the design vehicle that is used to design the space shall be described. Where handicapped access is required, parking space width/length and accessible route clearances shall be provided as required to meet current Uniform Federal Accessibility Standards and Americans with Disabilities Act Accessibility Guidelines. The following discusses the project specific parking requirements:

2.4.7.3.3.1. Quadrangle “Interior Area” POV parking will not be permitted within the quadrangle interior areas.

2.4.7.3.3.2. Reconstruct existing POV parking area adjacent to Bldg. 651 and Glennan Street. Approximate limits are indicated on the attached RFP drawings. The existing asphalt concrete pavement, base course, and subbase course shall be removed, replaced with a new a.c. pavement structure and striped to provide at least 35 angle parking stalls. Parking spaces shall be marked reserved for military staff, visitor and handicap accessible POV parking. After award, Contractor shall coordinate with the Government for exact number of stalls and labeling requirements. For pavement design requirements, see paragraph 2.6, Soils, Pavements and Earthwork.

2.4.7.3.3.3 Reconstruct the existing POV parking area across Bldg. 650 and along Foote Avenue. Approximate limits and conceptual layout are shown on attached RFP drawings. (Note that layout is for information purposes only and may be used to develop the design after award.) In addition, the reconstruction scope shall include the following minimum requirements.

2.4.7.3.3.3.1 Prior to restriping stalls and aisles for 90-degree parking, provide slurry sand coating on existing asphalt surfaces within scope.

2.4.7.3.3.3.2. Provide striped parking islands. In leiu of striped islands, concrete curbed islands with landscaping and automatic control irrigation is preferred.

2.4.7.3.3.3.3. Maintain smooth and safe traffic circulation between adjacent parking areas.

2.4.7.3.3.3.4. Provide a minimum of two (2) entrances off of Foote Avenue and one (1) off of Glennan Street.

2.4.7.3.3.3.5. Total number of POV parking provided shall be no less than 75 percent of the existing total parking stalls.

2.4.7.3.3.3.6. Provide 3 m (10 FT) wide pedestrian walkway and curbing along south edge of parking area. Provide drainage improvements as required to maintain existing drainage patterns. The pedestrian walkway shall include a landscape strip. See subsection General Design - Landscape, for additional requirements.

2.4.7.3.3.3.7 . Landscaping. Provide 7.6 m (20 feet) minimum wide landscaped buffer area along Glennan St. and 10 m (30 feet) minimum wide landscape buffer area along Foote Avenue. Provide landscape screen along for both buffer areas. For additional landscape design requirements, see subsection, General Design - Landscape.

2.4.7.4. Street Signs: Street name signs and traffic control signs shall be provided where appropriate and shall conform to requirements of U.S. Department of Transportation, Federal Highway Administration Manual on Uniform Traffic Control Devices for Streets and Highways. Non-traffic signs as well as building signage shall conform to the requirements of the installation. Signs shall be made of aluminum. All sign support posts shall be breakaway type. Height of sign above finished grade shall be 2.1 m (7 feet).

2.4.7.5. Traffic Control Devices and Pavement Markings: Traffic control devices and pavement markings shall conform to the Manual on Uniform Traffic Control Devices for Streets and Highways, U.S. Department of Transportation, Federal Highway Administration, unless otherwise specified herein or approved.

2.4.7.5.1 Centerline stripes are not required for parking lot aisles and Quad F interior driveways, unless otherwise specified. Stop or approved bar stripes shall be provided at intersections at stop conditions.

2.4.7.5.2 New or reconstructed roadways shall have double yellow thermoplastic centerline with prismatic reflectors.

2.4.7.5.3 Roadway edge lines where required or designated shall have white thermoplastic lines with prismatic reflectors.

2.4.7.5.4 Parking lot markings shall be painted with white 4-inch wide stripes.

2.4.7.5.5. Crosswalk and stop line markings shall be white thermoplastic striping. For typical detail, see Attachment, CROSSWALK & STOP DETAIL.

2.4.7.5.6 Pavement arrows on roads and parking lots shall be white thermoplastic striping.

2.4.8. Fencing. A temporary security fence shall be provided around the Contractor's operations and storage yard.

2.5. Soils, Pavements and Earthwork.

2.5.1. Soils Investigation Letter Report (Geotechnical Letter Report). Preliminary Soils Investigation Letter Report dated 24 January 2001 for Quad F is furnished in attachment entitled Preliminary Soils Investigation Letter. Based upon the data provided in the RFP and Preliminary Soils Investigation Letter Report, a comprehensive Final Soils Investigation Report shall be furnished by the Offeror to whom this contract is awarded. The Final Soils Investigation Report shall be prepared by a professional engineer registered in the State of Hawaii with more than 10 years of experience in soil mechanics and geotechnical engineering. The Final Soils Investigation Report shall certify to the adequacy of the soil and foundation aspects of the design, including, but not limited to, special foundation types, earthwork construction, surface and subsurface drainage, erosion and siltation prevention during and after construction, and settlement or heave. After Government review of the Final Soils Investigation Report, additional soil borings, testing, and investigation, if required, shall be furnished by the Offeror with the final design documents at no additional cost to the Government.

NOTE TO OFFEROR: The soils investigation report furnished by the Government is a Preliminary Letter Report intended for basic information only. The approximate subsurface soil conditions may not represent conditions at all locations. The flexible pavement sections shall be as required for actual traffic and soil conditions, but in no case shall they be lighter (thinner) than that indicated below and in the Preliminary Soils Investigation Letter Report. Should new traffic parameters or actual soil conditions require a heavier pavement structure, a thicker pavement section shall be furnished by the Offeror.

2.5.2. Minimum Pavement Structures:

Parking Lots:	50 mm (2”) Asphaltic Concrete, State DOT IV Mix, 150 mm (6”) Base Course, 125 mm (5”) Subbase Course

2.5.3. Soil Compaction.

2.5.3.1. Soil compaction shall be per local standards specified for use in this contract and as amended herein. Compact each layer to not less than the percentage of maximum density specified in Table 2-2, determined in accordance with ASTM D 1557 Method D:

TABLE 2-2 - SOIL COMPACTION

Subgrade Preparation, Fills, Embankments, and Backfills	Compaction Requirements (Percentage of Maximum Density)	
Structures & Building Slabs	Cohesive Material 90	Cohesionless Materials 95
Streets, Paved Areas, Bike Paths	90	95
Sidewalks and Grassed Areas	85	90

2.5.3.2. The compaction requirements shall be verified or modifications shall be recommended by the soils engineer in the Final Soils Report wherever engineering, soils, or climatic factors indicate the necessity to do so. Any modification to the stated compaction requirements shall require the approval of the Contracting Officer.

2.5.3.3. Soil Classification.

2.5.3.3.1. Cohesionless materials include materials classified in ASTM D 2487 as GW, GP, SW and SP. Cohesive materials include materials classified as GC, SC, ML, CL, and MH. Materials classified as GM and SM shall be identified as cohesionless only when the fines are nonplastic.

2.5.3.3.2. Satisfactory materials for filling and backfilling under all structures and general earthwork shall comprise any excavated on-site materials or imported materials classified in accordance with ASTM D 2487 as GW, GM, GC, GP, SW, SP, SM, SC, ML, MH, and CL, free of organic matter, stones larger than 75 mm (3-inches) in any dimension, other deleterious materials, and expansive values less than or equal to 2% when tested by the CBR method. For imported materials, that portion passing the No. 40 sieve shall be either nonplastic or shall have a liquid limit not greater than 40 and a plasticity index not greater than 15. Liquid limit and plasticity index shall be determined by ASTM D 4318. Where satisfactory materials are not available in sufficient quantity from required excavations, borrow materials shall be obtained from approved sources off Government-control land at the Contractor's responsibility.

2.5.3.4. Soil shall not be compacted in the tree protection zone.

2.5.4. Concrete Slab-On-Grade

2.5.4.1. Granular Termite Barrier (GTB): A 100 mm (4-inch) minimum thickness granular termite barrier shall be installed under the concrete slab of the covered gear wash area. The GTB shall be placed under the vapor barrier with a separation geotextile installed between the GTB and the capillary water barrier (CWB).

2.5.4.1.1. Exterior Perimeter Footings: When "stayform" is used to retain a vertical face along the inside of exterior footings, the bottom of the stayform shall be elevated 50 mm (2 inches) above the bottom of the footing to allow GTB material to migrate beneath the bottom of the stayform and separate the stayform and the subgrade. Along the outside edge of the footing, a minimum 100 mm (4-inch) wide, vertical GTB-filled-trench shall be provided. A root control fabric impregnated with plastic nodules containing trifluralin, Bio-barrier Root Control, or equal, shall be installed along the vertical interface between the GTB and the adjacent soil. The root control fabric shall provide continuous and effective root control for 15 years or longer. A cast-in-place concrete strip, 300 mm (12-inch) wide by 75 mm (3-inch) thick, with 5% transverse slope, shall be provided at the ground surface to cap the GTB strip. The concrete strip shall be reinforced with 6/6 X W2.0 X W2.0 WWF. Contraction joints shall be provided at maximum 4'-0" spacing.

2.5.4.1.2. The natural angle of repose of the GTB material is about 10H:3V when dry and 10H:3.75V when wet. Accordingly, GTB on sloping surfaces shall be placed at slopes no steeper than 3H:1V. This will require that the sloping faces of thickened-edge footings, including the under-side concrete fillet at edges of floor slabs, be designed with a batter no steeper than 3H:1V.

2.5.4.1.3. GTB Material Gradation.

Sieve Size	Percent Passing
(4.75 mm) No. 4	100
(2.36 mm) No. 8	95 - 100
(2.00 mm) No. 10	75 - 95
(1.70 mm) No. 12	35 - 50
(1.18 mm) No. 16	0 - 10

2.5.4.1.4. GTB Material Requirements

Rock Type:	Basalt
Specific Gravity (ASTM C 128):	2.70 to 2.80

SiO2 (ASTM C 289):	45% Minimum
L.A. Abrasion, % loss, 500 Revolutions (ASTM C 131):	20% Maximum
Moh Hardness Scale:	5 to 6

2.5.4.1.5. GTB material installed shall be clean and free of debris, dirt or other non-GTB material/substances that would compromise the GTB effectiveness. When GTB is installed in layers, the surface of the layer receiving additional GTB material shall be clean. Previously installed material if not clean shall be removed and replaced prior to installing additional GTB material.

2.5.4.1.6. Penetrations through the GTB other than that necessary for utility pipes/conduits shall not be made unless approved. Pipes laid in GTB material shall not be encased in sleeves or wraps that may provide a hidden path for termites. All utility pipes beneath the floor slab shall be encapsulated in minimum 100 mm (4 inches) of GTB material.

2.5.4.1.7. GTB material shall be compacted using approved equipment and methods.

2.5.4.1.8. No structure or appurtenance that is not protected by GTB material shall be allowed to be in direct contact with the dwelling unit itself

2.5.4.1.9. The Contractor's Design Proposal shall include typical GTB installation details beneath the slab and at pipe penetrations.

2.5.4.1.10. The Contractor shall submit a CQC plan to limit GTB material displacement before and during concrete placement. This is to maintain GTB material integrity and thickness for protection against termite infestation, and to maintain structural integrity of slabs and foundations.

2.5.4.2. Capillary Water Barrier and Vapor Barrier. Except as indicated hereinbelow, capillary water barrier and vapor barrier shall be placed beneath the concrete slab on grade. The capillary water barrier shall be 100 mm (4 inches) thick. The capillary water barrier material shall be a clean, crushed non-porous rock, crushed gravel or uncrushed gravel as approved. The maximum particle size shall be 40 mm (1-1/2 inches) and no more than 2 percent shall pass the 4.75 mm (No. 4) sieve. The capillary water barrier shall be compacted with a minimum of four (4) passes of a hand-operated, plate-type vibratory compactor. A vapor barrier shall be placed directly below the concrete slab and the GTB shall be installed under the vapor barrier but over a separation geotextile which is installed over the CWB layer.

The vapor barrier shall have the following properties:

Minimum 15-mil thick polyolefin geomembrane manufactured with ISO certified virgin resins.

Water Vapor Transmission Rate	ASTM E-96	not exceeding 0.006 gr./ft2/hr.
Permeance Rating	ASTM E-96	not exceeding 0.015 gr./ft2/hr.
Water Vapor Retarder	ASTM E-1745	meets or exceeds Class B
Puncture Resistance	ASTM E-1709	minimum 1970 grams
Tensile Strength	ASTM D-638	minimum 45 lbf/in.

Installation of the vapor barrier shall be per manufacturer's instructions with the following as the minimum; joints shall be lapped a minimum of 300 mm (12 inches) and sealed with the manufacturer's recommended mastic or pressure sensitive tape. The vapor barrier shall be lapped over footings or sealed to foundations. The contractor shall check the vapor barrier surface, seams and penetrations at columns and utilities for damage and discontinuities prior to the concrete slab placement. The check shall be performed in the presence of the Contracting Officers Representative.

Standing water on the vapor barrier shall be removed prior to the concrete slab placement. The GTB shall be dampened, free of drainable water, and compacted the day before vapor barrier placement. The

general contractor shall protect all exposed GTB surfaces from ponding of water or rainwater by sealing any entry points in uncompleted slabs or in unroofed buildings.

The separation geotextile shall have the minimum requirements for Class 2 as specified in AASHTO M 288-96 for geotextile survivability requirements.

2.5.5. Earthwork for Building and Utility Systems shall be design and constructed in accordance with UFGS Section 02315, Excavation, Filling and Backfilling for Buildings and Section 02316, Excavation, Trenching, and Backfilling for Utility Systems unless otherwise specified herein or as approved.

2.5.5.1. Satisfactory Materials. Imported satisfactory materials shall be free from stones larger than 75 mm (3-inches) in any dimension.

2.5.5.2. Excavation Permits. Prior to beginning excavation work, the Contractor shall obtain excavation permits from DPW & Verizon. Contractor shall complete the DPW "Excavation Clearance Requirements" and submit the completed form to the Contracting Officer and DPW in order to obtain the following:

a. "DPW Excavation Permit" for Water, Sewer, Storm Drainage, Electrical, Gas, Fuel lines, etc.

b. Excavation Permit for telephone lines (communications) form Verizon and DPW Greg Gardner (Bldg. T-121, Fort Shafter, Phone 438-8066).

Contractor shall carry both permits at all times during excavation.

2.5.5.3. Disposal. Excavated material not required or not satisfactory for backfill shall be removed from the site and disposed of off base.

2.5.5.4 Haul Route. Haul route shall be coordinated with the DPW traffic engineer.

2.5.5.5. Special Requirements. Water line trenches shall be of a depth to provide a minimum cover of 1 m (3 ft.) in areas subject to vehicular traffic and 0.70 m (2.5 ft.) in all other areas from the existing ground surface, or from the indicated finish grade, which ever is lower, to the top of pipe.

2.6. Grading and Storm Drainage System. Storm drainage system design shall be designed in accordance with City and County of Honolulu Storm drainage Standards and as specified herein or approved. Construction materials, execution and testing shall be in accordance with UFGS/CEGS Specification Section 2630a, Storm Drainage System; and as specified herein or approved.

2.6.1. General. Drainage from the Quadrangle interior areas building drains and adjacent areas bounded by Waianae Ave., Lewis St. and Foot Ave.; shall be intercepted and drained off site. In addition to the onsite drainage improvements, existing storm drainage lines along Lewis Street and along the realign reach of Foot Ave. shall be upgraded. Proposals shall be in accordance with the recommendations of the Draft Report, FY96 OMA Family Housing Master Plan and Infrastructure Study, Army Storm Drainage Infrastructure Study For Schofield Barracks, March 2001. A copy of the Draft report and Master Plan Maps will be available for review at Honolulu District, Bldg. 230, Rm. 225, Fort Shafter, Hawaii. After award, Contractor is responsible for validating the study hydraulic analysis and recommendations. Photo copied excepts from the Storm Drainage Master Plan Maps are included in Attachment, Schofield Barracks Master Plan Maps, Draft Report, FY96 OMA Family Housing Master Plan and Infrastructure Study, Army Storm Drainage Infrastructure Study For Schofield Barracks, The following table indicates the minimum required improvements:

Table 2-3

BEGIN MH/INLET NO.	END MH/INLET NO.	EXST PIPE DIA. (INCH)	NEW PIPE DIA. (INCH)

DMH-D6-022	DMH-D6-017	24	36
DMH-D6-017	DMH-D6-014	24	42
DMH-D6-032	DMH-D6-047	24	36
DMH-D6-047	DI-D6-130	12	18
DMH-D6-043	DI-D6-121	10	18
DI-D6-121	DI-D6-124	10	18
DI-D8-131	DI-D8-130	8	12
DI-D8-130	DI-D8-066	8	18
DI-D8-066	DI-D8-126	8	24
DI-D8-065	DI-D8-066	18	36

2.6.2. Connections to Existing Systems. Connections to existing systems shall be made at locations as indicated on the drawings or as approved.

2.6.3. Grading and drainage design shall be properly coordinated with surrounding properties and facilities to insure that runoff do not cause damage outside of the project limits. Existing drainage patterns shall be maintained as much as practicable.

2.6.4. Sumps and low points where water ponds shall be avoided whenever practical so as to preclude flooding of buildings and roads when design capacities of drainage systems are exceeded. Where sumps can not be avoided, higher design capacities may be directed for systems draining the sumps and positive overland flow relief provided to preclude flooding of dwelling units and critical utility appurtenances such as electrical transformers.

2.6.5 Inlets and Manholes.

2.6.5.1 Materials shall be of cast-in-place reinforce concrete or pre-cast reinforced concrete sections. Precast manholes shall have eccentric cone tops to permit vertical descent within the manhole.

2.6.5.2 Locate manholes or inlets at intersections, changes in alignment or grade or size, at junctions with laterals of branches or wherever entry for maintenance is required. Storm drain inlets shall be located so that no collection swales flow across a street or sidewalk to reach a storm drain other than where cross gutters are used. For streets and roadways, side opening catch basins are preferable. Distance between points of entry will not be more than 90 meters (300 feet) for conduits with a minimum diameter smaller than 30 inches and up to 150 meters (500 feet) for diameter 30 inches or larger.

2.6.5.3 Inside dimensions of manholes will not be less than 0.760 meter (2.5 feet). Inside dimensions of inlets will provide for not less than 75 mm (3-inches) of wall on either side of the outside diameter of the largest pipe involved or not less than 0.760 meter (2.5 feet), which ever is greater.

2.6.5.4 Manhole frame and cover shall be round will a minimum clear opening of 760mm (30 inches).

2.6.5.5 Manholes and inlets deeper than 900 mm (3 feet) shall have a fixed stainless steel ladder, Type 316 Stainless Steel (SS).

2.6.6. Open ditches and channels are not allowed unless specifically approved. Grassed swales shall have a one (1) percent minimum invert slope unless the invert is paved with and approved concrete lining. Open areas shall be drained by field inlets and an underground collection system, utilize existing system as much as possible. Overland flow shall be held to a minimum. Swales shall have cross-sections that do not restrict the use of powered mowing equipment.

2.6.7. All streets shall be crowned or sloped to drain. Concrete gutters shall be provided on both sides of streets. Street drain inlets shall be curb opening type. Drop inlets with grates are not allowed.

2.6.8 Maximum Gutter Flow. Maximum flow in all gutters shall be restricted to the quantity, which will cause flooding of 1/2 of the adjacent traffic lane at the design storm. When this flow is reached, it shall be intercepted by catch basins and removed to an underground drainage system.

2.6.9. Minimal size for drain pipes along roadways and vehicle traffic areas shall be 450 mm (18-inches) and pipe material reinforced concrete. Minimal pipe size for all other areas shall be 300 mm (12-inch) and materials shall be reinforced concrete pipe, schedule 40 PVC pipe, or smooth interior corrugated polyethylene pipe. For corrugated polyethylene pipe, the couplings joints shall be the watertight type.

2.6.10. Grade Transitions around Existing Tree. The natural grade shall be maintained within the tree protection zone. Surface drainage away from existing trees shall be provided. For additional tree protection requirements, see Subsection 9, Landscaping Design.

2.6.11. EPA National Pollution Discharge Elimination System (NPDES) Permits. The Design-Building Contractor shall determine if a permit is required. If the permit is required, the Contractor shall prepare the documentation for the Storm Water Prevention Plan (SWPPP) and monitoring plan and submit to the Contracting Officer's Representative.

2.6.12. Storm Runoff Calculation. Storm runoff shall be calculated with consideration for the following:

2.6.12.1. Select design values to be used in the storm drainage design calculations, including rainfall intensity, drainage area, and runoff coefficients.

2.6.12.2. Select storm drainage plan with respect to planned connections to the existing storm drainage system, when applicable.

2.6.12.3. Alternate schemes considered in arriving at selected storm drainage plan.

2.6.12.4. Principal means of collection and disposal of storm water in the new storm drainage system. Include calculations for runoff, sizing of pipe and drainage structures (inlets and drainage control structures and roof drainage pipe).

2.6.12.5. Method proposed for handling roof runoff from gutter downspouts (roof drain collector system into drainage system).

2.6.12.6. Connections of building's mechanical drains to outside drainage system, where applicable, and cross referencing to the appropriate section and design discipline, when required.

2.6.13 Specific Storm Drainage Criteria.

A 10-year 1-hour intensity design storm shall be used to calculate the runoff. The time of concentration (Tc) for storm drainage system shall be no less than 10 minutes for paved areas and 20 minutes for turfed areas. Runoff shall be controlled by a storm drainage system properly designed to eliminate erosion.

Storm drainage systems will be so designed that the hydraulic gradeline for the computed design discharge in as near optimum depth as practicable and velocities are not less than 0.760 m/s2.5 feet/s when drains are one third or more full.

2.6.14 Sidewalk Culverts. Sidewalk culverts are not permitted.

2.7. Water Distribution System. Water system shall be designed in accordance with TM 5-813-5, Water Supply Distribution Systems (A copy of TM 813-5 is attached.) and Military Handbook Fire Protection for Facilities Engineering, Design and Construction, (Mil Hdbk 1008c); and as indicated herein or approved. Construction materials, execution and testing shall be in accordance with UFGS Section 02510, Water Distribution System; and as specified herein or approved.

2.7.1. General. The existing water systems servicing the existing quadrangle facilities shall be removed and replaced (unless other wise indicated or approved) with upgrade systems to support renovated and new facility service requirements and to meet current design and construction standards.

2.7.2. Connections to Existing Systems. Contractor shall connect to the existing 300-mm (12-inch) water main along Waianae Avenue, as indicated on the drawings or as approved.

2.7.3. Mains. Mains shall be considered as that part of the distribution system that supplies fire hydrants. Water mains shall be looped with no dead ends unless specifically approved in writing. Minimum main size shall be 200 mm (8 inches). Mains shall be ductile iron or Polyvinyl chloride (PVC). All ductile iron pipes, cast iron fittings to include couplings and valves shall be wrapped with 8-mil thick polyethylene encasement per AWWA C105.

2.7.4. Main Locations. Mains shall be generally located along streets setback a minimum of 1.5m (5 feet) from pavement areas, and on the street side opposite from electrical/telephone/CATV lines. Mains shall be setback a minimum of 1.5 m (5 feet) from any building or structure. This shall be specifically coordinated between civil and electrical design disciplines during proposal stage.

2.7.5. Main Markers and Tracing Wires. All mains shall be provided with commercial plastic marking tape specifically manufactured for this use. Tracing wire shall be copper solid #10 and shall extend into valve box stations.

2.7.6. Flow and Pressures. The distribution system must reliably and economically supply water, in adequate quantities and at adequate pressures. Criteria for determining domestic water demands shall be per TM 5-813-1/AFM 88-10, Volume 1., Chapter 2. Criteria for determining fire flow demands shall be per Mil Hdbk 1008c. Minimum ground-level residual pressures at fire hydrants will be at least 10 pounds per square inch while supplying flows.

2.7.7. Hydrant Flow Test Data. The following flow test data are provide for offeror's use to evaluate available water supply and design water systems: (Note that after award of D-B contract, the contractor is responsible for verify the pressure and flow capacity of the system. Any subsequent hydrant flow tests shall be conducted with the Schofield clear well pumps off. POC for Schofield Barracks Water Plant is Wade Nakai, 655-2510.)

Test Date/Time: 30 Jan. 2001/10:00 am

Clear Well Pumps Off/On: Off*

Static/Residual Pressure Hydrant ID: F-1 (Corner of Waianae Ave. and Lewis St.)
Static Pressure (psi): 47
Residual (psi): 42

Flow/Test Hydrant ID: F-5 (Waianae Ave. and adjacent to Bldg. 627)
Nozzle Diameter Flowed: 2.5 -inch
Flow (GPM): 890

2.7.8. Fire Hydrants. Fire hydrant special requirements are as follows.

2.7.8.1. Type and Nozzles. Fire hydrants shall be wet-barrel with one 4-1/2 inch and two 2-1/2 inch outlets, with the center of hose outlets a minimum of 0.45 m (18 inches) above finish grade. Each hydrant shall include a quick coupling type adapter for fire pumper truck connection. Each hydrant shall have a quick-coupler furnished for the 115-mm (4.5-inch) outlet. Each hydrant supply shall be provided with minimum 6" connection through shutoff valve and isolation valve box.

2.7.8.2 Spacing. Hydrant distributions will conform to TM 5-813-5/AFM 88-10, Vol. 5., Mil Hdbk 1008c and the following requirements.

2.7.8.3. Hydrants shall be located a minimum of 15.2 m (50 feet) from buildings protected and in no case will hydrants be located closer than 25 feet to a building, except where building walls are blank firewalls. Hydrants shall be located near intersections for maximum coverage and on fire truck approaches to buildings, especially for dead-end streets. At least one hydrant shall be located within 150 feet of the building sprinkler riser fire department connection. Hydrants shall not be located in sidewalks or where obstructed by structures or landscaping. Hydrants shall not be located near electrical transformers or all types of utility manholes or handholes to preclude flooding should a break occur.

2.7.8.4. Hydrant locations along streets shall be identified with approved raised blue pavement reflector markers offset 100 mm (4 inches) towards the hydrant from the road center.

2.7.8.5. Hydrants shall be painted Norwood brown; exact color to be coordinated with the Contracting Officer.

2.7.9. Service Laterals and Water Meters. Meters shall be provided to allow the monitoring of water consumption for Quad F buildings. Meters shall be adequately sized to meet the building water flow and pressure demand. Maximum velocity shall be 10 feet per second. Meters shall be located in accessible areas out of the way of vehicular traffic. Special requirements are as follows.

2.7.9.1. Water Meters shall be of one manufacturer and of the same model for a given size. Meters shall be of the displacement or vertical turbine type conforming to AWWA C701 Class II unless otherwise specified or approved. Meters shall be sized and of the appropriate type to insure adequate service pressures and flow can be maintained within manufacturer sizing recommendations. The main casing shall be bronze with stainless steel external fasteners. Registers shall be straight -reading type, shall be permanently sealed and shall read in U.S.-gallons. Digital indicator-totalizer shall be sealed and magnetically coupled with the driving mechanism. A leak detector hand shall be provided to indicate very low flow (due to leakage). Connections shall be suitable to the type of pipe and conditions encountered. Register type shall be an encoder-type remote register designed in accordance with AWWA C707. Remote mounting adapter kit with up to 15.24m (50 ft) of cable shall be used to connect the water meter to the remote sensor on the building. Meters shall comply with the accuracy and capacity requirements of AWWA C701.

2.7.9.2. Meters Boxes. Meters shall be installed in approved meter boxes or vaults large enough for the installation of a shut off valve and meter and shall be large enough for easy maintenance and removal of meters. Meter registers shall be readily readable with reading ports in box covers provided. Shut off valves shall be provided on each side of meters. Straight pipe sections shall be provided when recommended by the manufacturer. Meters larger than 50 mm (2 inches) shall be provided with bypass line and valve of approved size. Meter boxes set in paved areas subject to vehicular traffic shall be cast iron, or concrete with cast iron lid and cast iron meter reader lid. Boxes set in sidewalks, not subject to vehicular traffic, shall be concrete with cast iron lid and cast iron meter reader lid. Plastic boxes and lids shall not be used. Box height shall extend from invert of the meter to final grade at the meter location. The lid shall have the word “WATER” cast in it.

2.7.9.3. Contractor shall as directed provide to the Contracting Officer for turn over to DPW a minimum of one-meter splice and one spare meter each size installed in this project.

2.7.9.4. When a meter services a single building, the pressure regulator shall be installed above ground.

2.7.9.5. Service lines shall be engineered with building interior plumbing to insure that wide fluctuations in pressure, water flow, and temperature do not occur. Meter head losses shall be included in design analyses hydraulic calculations for domestic services.

2.7.9.6. Each building shall have an exterior shut off valve with valve box installed underground.

2.7.9.7. Service lines shall not cross streets and driveways except for connections to mains.

2.7.9.8. Service lines shall be copper pipe and fittings, Type “K”, polyvinyl chloride (PVC), or ductile iron unless other wised approved.

2.7.10. Water main Clearances to Sewers. Water mains shall be laid horizontally 3 m (10 feet) or more from sanitary sewers. Exception is where the bottom of the water pipe is a minimum of 450 mm (18 inches) above the sewer pipe top, in which case, the horizontal separation shall be 1.8 m (6 feet) or greater. Service lines shall have a minimum vertical separation of 300-mm (12 inches) above sewer laterals unless otherwise approved. Where water mains cross within 450 mm (18 inches) above or any distance below gravity flow sanitary sewer lines, the sewer pipe shall be encased with an approved reinforced concrete jacket of 150 mm (6 inch) minimum cover around the pipe to a distance of 3 m (10 feet) horizontally from the water line. Encasement shall start and end at sewer pipe joints.

2.7.11. Miscellaneous Appurtenances. Miscellaneous appurtenances shall be as approved.

2.7.12. Bacteriological Disinfection.

Before acceptance of potable water operation, each unit of completed waterline shall be disinfected in accordance with UFGS Section 2510, Water Distribution System and AWWA C651 unless otherwise specified herein or approved. From several points in the unit, the Contracting officer will take samples of the water in proper sterilized containers for bacterial examination. The unit will not be accepted until satisfactory bacteriological results have been obtained. Contractor shall be responsible for neutralization of and proper disposal of testing and disinfection waters in accordance with State of Hawaii and Tripler Army Medical Center, Preventive Medicine Office, regulations, etc. The chlorinated water may be used for watering grassy areas if the chlorine concentration is reduced to that of drinking water.

2.7.13. Lead Residual. Following the bacteriological disinfection and testing, the system shall be flushed with a sufficient velocity of water and sufficient tests performed at each hot and cold water discharge point until no more than 15 ppb lead residuals remain in the system. All test and samples shall be performed in accordance with state and, if applicable, Federal regulations. Samples for testing are to be collected after a 6-hour continuous period of no flushing, and will be considered first draw samples. The commercial laboratory shall be certified by the state’s approving authority for examination of potable water. Lead residual tests results shall be submitted to the Contracting Officer. The system will not be accepted until satisfactory bacteriological results and lead test residual test results have been obtained. All flushing and testing for lead residuals, including.

2.7.14. Interruption of Water Supply. Contractor shall inform the Contracting Officer a minimum of 45 calendar days in advance of any interruption of service in the existing water system. Valves shall be closed and opened only by DPW authorized personnel unless otherwise approved in writing.

2.7.15. Pressure Reducing Valves. Main line pressure reducing valves are not permitted in this project.

2.7.16. Protection from Fire Systems. Potable water supplies to fire protection systems, including but not limited to stand pipes and automatic sprinkler systems, shall be protected from backpressure and back siphonage by a double check valve assembly. The valve assembly shall be located down stream of the post indicator valve and before the building riser pipe connection. Double check valve assembly shall in accordance with AWWA C506 and NFPA 24. Valve assemblies shall be of one manufacturer and of the same model for a given size.

2.7.17. Post Indicator Valves. Every connection from a private fire service main to a building shall be provided with a listed indicating valve so located as to control al sources of water except fire department connections unless other wise approved by the authority having jurisdiction. Post indicator valves shall be located not less than 12.2 m (40 ft) from buildings. When necessary to place a valve closer to a building, the indicator post shall be located at a blank part of a wall.

2.8. Sanitary Sewage System. The sanitary sewage system shall be designed in accordance with Technical Instructions, TI-814-10, Wastewater Collection; and as specified herein or approved. Construction materials, execution and testing shall be in accordance with UFGS Section 02531A, Sanitary Sewers and as specified herein or approved.

2.8.1 General. The existing sewer systems servicing the existing quadrangle facilities shall be removed and replaced (unless other wise indicated or approved) with upgrade systems to support renovated and new facility service requirements and to meet current design and construction standards.

2.8.2. Connections to Existing Systems and Layouts. Contractor shall connect to existing sewer manhole S-500-28, as indicated on the attached RFP drawings or as approved. Designer shall ensure that down stream systems have adequate capacity to meet peak design flows.

2.8.2.1. Sewer mains shall be located along street or off-streets in readily accessible areas. Sewer mains in streets shall be located such that manholes are installed 2.4 m (8 feet) or greater from curb faces and away from street low points to minimize water infiltration.

2.8.2.2. Mains shall be 200-mm (8 inches) minimum size.

2.8.2.3. All mains shall be provided with copper solid #10 tracing wire.

2.8.2.4. Prior to design, the project civil engineer shall inspect the proposed connection points to existing manholes and determine if the sewer line is flowing near capacity. If the existing line is flowing near capacity, the invert of the new main should be set to be above the crown of existing main.

2.8.2.5. Connections to existing mains should be less than 90 degrees to the main line flow.

2.8.2.6. Pipe material for sewer mains and laterals shall be plastic pipe within minimal pipe joints.

2.8.3. Manholes.

2.8.3.1. Precast manholes shall have eccentric cone tops to permit vertical descent within the manhole.

2.8.3.2. Manholes shall have essentially watertight walls and pipe connections to control ground water infiltration.

2.8.3.3. Manholes deeper than 900 mm (3 feet) shall have stainless steel rungs, Type 316 Stainless Steel (SS).

2.8.3.4. Each new or modified manhole that is located in roads or grass areas that are located in low areas subject to flooding shall be installed with manhole cover inserts to prevent inflow of rainwater; reduce manhole rattling and flipping due to street traffic; and prevent dirt and debris form entering collection system through manhole cover. Manhole insert material and dimensions shall be in accordance with City and County of Honolulu Standards and as specified herein.

2.8.3.4.1. The inserts shall be made of corrosion proof material suitable for atmospheres containing hydrogen sulfide and diluted sulfuric acid as well as other gases associated with wastewater collection. The body of the material shall be made of high density polyethylene co-polmer, or approved equal that meets ASTM Specifications Designation D1248, Class A, Category 5, Type III, equal to Marlex HXM 50100 (extra high molecular weight hexene co polymer).

2.8.3.4.2. The manhole inserts shall have a minimum impact brittleness temperature of 105 degrees Fahrenheit or less The thickness shall be uniform 1/8-inch or greater. The material shall be firm enough such that the inserts will not fold and fall into the manhole due to any accumulation of debris and water. It shall also be resistant to environmental stress cracking.

2.8.3.4.3. The gasket shall be made of closed cell neoprene. The gasket shall have pressure sensitive adhesive on one side and be placed under the weight bearing surface of the manhole insert by the manufacturer. The adhesive must be compatible with the insert material to form a long lasting bond in wet or dry conditions.

2.8.3.4.4. A lift strap shall be attached to the rising edge of the bowl of the manhole inserts with a stainless steel rivet. The lift strap shall be made of one-inch (1") wide, woven polypropylene web and sheared on all cut ends to prevent unraveling. The inserts shall be sized to fit City and County of Honolulu Standard Type SA manhole frame and covers.

2.8.3.5. New manholes should be located to avoid bends 90 degrees or larger.

2.8.3.6. Drop Manholes, if required, shall be in accordance with City and County of Honolulu standards.

2.8.3.7. Abandoned Manholes and Sewer lines. Abandoned sewer lines should be plugged with concrete at each end. The concrete plug shall extend from the manhole to a minimum 0.6 m (2 ft.) into the abandoned line. Abandoned manholes shall have the bottoms cracked to permit subsurface water drainage though the bottom. The manhole shall be backfilled with (a) compacted granular material, base course or S4C or (b) lean concrete. The manhole cover should be completely removed along with the manhole cone or the upper 1 m or (3 ft.) for cast-in-place manholes.

2.8.4 Sewer Laterals.

2.8.4.1. Laterals minimum size shall be 150 mm (6 inches). Laterals shall be sized based upon fixture unit flow.

2.8.4.2. Minimum lateral slope shall be 1.0 percent unless otherwise approved.

2.8.4.3. Building connections shall be planned to eliminate as many bends as practical and provide convenience in rodding. Bends greater than 45 degrees made with one fitting should be avoided; combinations of elbows such as 45-45 or 30-60 degrees should be used with a cleanout provided. Only house sewer lines may be placed under buildings; however, one sewer lateral may be provided for one housing building with multiple dwelling units provided adequate cleanouts are furnished to effect easy maintenance. Such sewer designs shall be as approved. Multiple dwelling unit single laterals shall have a cleanout installed where the line exits the structure and within 1.5 m (5 feet) of the exterior wall.

2.8.4.4. Laterals shall use standard "wye" fittings. Cleanouts shall be provided at all junctions and major bends as directed. However, a manhole must be used if the connection is more than30 m (100 feet) from the building cleanout.

2.8.4.5. Cleanouts shall be of approved materials and design. They shall be installed on all building connections to provide a means for inserting rods in to the underground pipe and installed flush with the finish ground to preclude damage to mower equipment and tripping. Two-way cleanout shall be provided at building connections to permit complete rodding of the building connection. Preferably the cleanout will be of the same diameter as the building sewer, and never smaller than 150 mm (6-inches). Cleanout cap shall be recess type. Cleanout tops in grassed areas shall be provided with a 375 mm (15 inch) square by 150 mm (6 inch) thick concrete collar reinforced with #3 rebar on all sides.

2.8.4.6. New lateral inverts should be above the crown of existing mains.

2.8.5. Sewer Pipe Joints. Sewer mains within the tree drip line shall be wrapped at the joints with a 'bio' or root type barrier membrane. Root barrier shall be suitable for pipe joint wrap application and shall be installed in accordance with the manufacturer's specifications.

2.9. Mechanical Design - Site Redevelopment.

2.9.1 Underground Chilled Water (for Air Conditioning) and Hot Water (Domestic) Distribution Systems: Where used, systems shall comply with the requirements of CEGS 02555 titled "Pre-Fabricated Underground Heating/Cooling Distribution System". It should be noted that existing Quad F chilled water distribution system is looped to the chilled water distribution system of Quad E. As-built drawings (Hawaiian Electric drawings dated August 2000 which are provided as part of this RFP package)) show the location of this loop piping. Design for this project shall replace the Quad F distribution system and the portion of the chilled water system that feeds Quad E up to Lewis Street. New chilled water distribution layout within Quad F will be left to the designer

2.9.2 For additional exterior site design requirements, see Subsection, General Design - Mechanical.

2.10. Electrical Design - Site Redevelopment.

2.10.1 For exterior electrical distribution, lighting, telecommunication, cable television system general design requirements, see Subsection, General Design - Electrical.

3. GENERAL DESIGN - ARCHITECTURE

3.1. General Requirements. This section applies to all buildings under this RFP unless specifically noted otherwise in sections 13 through 18.

3.2 Sound Attenuation. This paragraph is limited to new construction.

3.2.1. Testing. Certified proof-of-performance field tests will be conducted to demonstrate that the floor and wall systems as constructed provide the required sound isolation. Tests for air-borne sound shall be made in compliance with ASTM E336. Tests for impact sound shall be made in compliance with ASTM E1007. Testing of 10 percent (minimum) of each type of floor and wall system is required. Location of test sites will be chosen at random by the Contracting Officer.

3.2.1.1.1 Any wall or floor system found to be inadequate shall have the deficiencies corrected and the additional qualifying tests conducted at the contractor's expense. Testing at the contractor's expense of greater than 10 percent of each system may be required if the Contracting Officer determines that the quality of construction requires this additional testing.

3.2.2. Party walls and party floors (floor/ceiling construction between different organizational units) shall be designed to provide the minimum airborne sound transmission ratings and impact isolation ratings stated in Table 3-1.

TABLE 3-1 - SOUND TRANSMISSION STANDARDS FOR PARTY WALLS AND PARTY FLOOR CONSTRUCTION

Area	FSTC[1]	FIIC[2]
Party Walls	52	N/A
Party Floors at Primary Sleeping/Living Rooms.	52	65
Party Floors at Bathrooms, Utility, Laundry, & Equipment Rooms.	52	57

Note[1]: Field Sound Transmission Class. See ASTM E336.

Note[2]: Field Impact Isolation Class. See ASTM E1007.

3.2.3. Insulation. Insulation shall be provided to meet the following requirements:

Thermal and sound insulation shall have a flame spread rating of 25 or less and a smoke development rating of 50 or less exclusive of the vapor barrier when tested in accordance with ASTM E 84. A vapor barrier shall be provided on the warm side of exterior and ceiling insulation for thermal insulation.

3.2.3.1. Urethane is not allowed as an insulation material.

Interior Finishes.

3.3.1. Walls and ceilings. Provide 13 mm (1/2-inches) gypsum wallboard, taped and slightly textured finished. Water-resistant wallboard shall be used in wet areas such as bathroom and laundry rooms, and cementitious backer board shall be used for ceramic tile applications. Textured ceiling finish may be provided in areas other than laundry or bathrooms. Interior finish on walls and ceilings shall be in accordance with NFPA 101. Provide access to maintain and service equipment above the ceiling.

3.3.2. Flooring and base. Laundry and utility room flooring shall be sheet, seamless vinyl with wood or vinyl base. All other flooring areas shall have 2 mm (3/32-inches) vinyl composition tile with wood base or resilient base. Public bathrooms shall have ceramic tile flooring with ceramic tile base, terrazzo, or seamless sheet vinyl with premolded vinyl base or terrazzo base to match.

3.3.2.1. Sheet vinyl shall conform to ASTM F 1303, Type II, Grade 1. Sheet and tile vinyl flooring shall be installed as a monolithic material with seams welded or bonded for a seamless installation.

3.3.2.2. Ceramic tile shall conform to ANSI 137.1, moderate or heavy grade.

3.3.(3) Paint Finishes and Coating:

3.3.3.1. Interior surfaces, except factory prefinished material, shall be painted a minimum of one prime coat and one finish coat. Baths and laundry rooms, and all their painted trim shall be finish painted with semi-gloss latex. Natural finished interior doors are acceptable. All other areas shall be water-based latex low sheen washable eggshell finish for walls/trims and water-based latex low sheen washable eggshell finish for ceilings. Oil-based paint is not allowed except for surfaces that require special coating. Interior paint finish may be textured. When semi-gloss and low sheen painted surfaces are adjacent to each other, the wall surfaces in the room shall be finished with semi-gloss paint to avoid having two different finishes adjacent to each other.

3.3.3.2. All exterior surfaces, except brick, and factory finished siding, including all utility appendages, shall receive a minimum of one prime coat and two finish coats of paint. Exterior paint shall be water-based latex. Exterior low sheen stains (two coats) will be acceptable, where appropriate for wood. Stucco shall be provided with integral color and shall be sealed with a sealer as recommended by the manufacturer. Oil-based paint is not allowed except for surfaces that require special coating.

3.3.3.2.1. If CMU is used, a base coat solvent-thinned block filler, Fed. Spec. TT-F-1098 shall be used for the interior and a base coat of cement-emulsion filler shall be used for the exterior. The option to use Fed. Spec. TT-F-1098 for the exterior may be exercised if contractor can demonstrate that multiple coats applied will provide a pinhole free finish.

3.3.3.2.2. Finish coats for all CMU and concrete surfaces shall be Fed. Spec. TT-P-19.

3.3.3.3. Exterior Finish coatings will be the manufacturer's standard base coat/finish with acrylic coating systems.

3.3.3.4. Application of Paint: Paint shall be applied by brush or roller. Spray painting method shall be used only under approved conditions. Spraying shall be done only when there is no wind, or under very low wind velocity. When wind velocity increases, all spraying operation shall be stopped as directed by the Contracting Officer. Before start of spraying, all surfaces that do not require painting shall be completely masked and protected. Adequate drop cloths shall be provided over floors, adjacent sidewalks, and over all cars parked nearby that may be stained or damaged from the spray work. The Contractor shall be liable for all damage resulting from the spray painting operation. All such damages shall be satisfactorily repaired and resolved at no additional cost to the Government. Adequate ventilation shall be provided during paint application. Respirators shall be worn by all persons engaged in spray painting. Adjacent areas shall be protected by approved precautionary measures.

3.3.4. Painting Schedule: Primers, paints, and stains shall meet or exceed the latest Federal publications listed, and shall be lead free conforming to The Consumer Product Safety Act (CPSA). Interior surfaces, except factory prefinished material, shall be painted a minimum of one prime coat and one finish coat. All walls and ceilings in baths, laundry, utility rooms, and all painted trim shall be painted with semi-gloss latex. Colors shall be submitted by the Contractor and approved by the Contracting Officer. Blown-on acoustic finish is prohibited.

3.3.4.1. Paints shall meet the following publications. All paints and stain, including color pigments, shall be "lead-free:, conforming to The Consumer Product Safety Act (CPSA). The following publications are for reference only.

Federal Specifications (FS):

TT-C-542	Coating, Polyurethane, Oil-Free, Moisture Curing
TT-C-555	Coating, Textured (For Interior and Exterior Masonry Surfaces)
TT-E-489	Enamel, Alkyd, Gloss (For Exterior and Interior Surfaces)
TT-E-2784	Enamel (Acrylic-Emulsion, Exterior Gloss and Semigloss)
TT-P-19	Paint, Latex (Acrylic Emulsion), Exterior, Wood and Masonry
TT-P-28	Paint, Aluminum, Heat Resisting (1200 Degrees F.)
TT-P-38	Paint, Aluminum, Ready-Mixed
TT-P-645	Primer, Paint, Zinc-Molybdate, Alkyd Type
TT-S-176	Sealer, Surface, Varnish Type, Floor, Wood and Cork
TT-S-223	Sealer, Surface, Floor, Water Emulsion Type
TT-S-708	Stain, Oil; Semi-Transparent, Wood, Exterior
TT-S-00l992	Stain, Latex, Exterior For Wood Surface
TT-V119	Varnish, Spar, Phenolic-Resin
TT-V-121	Varnish, Spar, Water-Resisting

Commercial Item Description (CID):

A-A-1500	Sealer Surfaces (Latex Block Filler)
A-A-1546	Rubbing Varnish
A-A-1632	(Basic) Varnish, Asphalt
A-A-1788	(Basic) Varnish, Oil: Interior
A-A-2246	Paint, Latex (Gloss, Interior)
A-A-2247	Paint, Latex (Semigloss, Interior)
A-A-2248	Paint, Latex, (Flat, Interior)
A-A-2235	(Basic) Sealer, surface (Varnish Type, Wood and Cork Floors)
A-A-2336	Primer Coating (Oil-Alkyd, Exterior Wood, White and Tints)
A-A-2339	(Basic) Stain (Wood, Solvent-Dye Type)
A-A-2340	Primer Coating (Latex, White, for Gypsum Wallboard)
A-A-2542	(Basic) Sealer, Terrazzo and concrete Floors, Water based
A-A-2834	Urethane, Waterborne (Low VOC, Clear)
A-A-2867	(Basic) Coating, Polyurethane, Single component Moisture Cure, Alipathic
A-A-2962	(Basic) Enamel, Alkyd
A-A-2994	(Basic) Primer Coating, Interior, for Walls and Woods

Steel Structures Painting Council (SSPC) Specifications:

SSPC -Paint 5	(1991) Zinc Dust, Zinc Oxide & Phenolic Varnish Paint
SSPC-Paint 18	Chlorinated Rubber Intermediate Coat Paint
SSPC-Paint 20	(1991) Zinc-Rich Primers (Type I - Inorganic and Type II - Organic)
SSPC-Paint 25	(1991) Red Iron Oxide, Zinc Oxide, Raw Linseed Oil and Alkyd Primer (Without Lead and Chromate Pigments)
SSPC-Paint 26	(1991) Slow Drying Linseed Oil Black Maintenance Primer (Without Lead and Chromate Pigments)
SSPC SP 1	(1982) Solvent Cleaning
SSPC SP 2	(1995) Hand Tool Cleaning
SSPC SP 3	(1995) Power Tool Cleaning
SSPC SP 6	(1994) Commercial Blast Cleaning
SSPC SP 7	(1994) Brush-Off Blast Cleaning

3.3.4.2. Cement-Emulsion Fill Coat: Fill coat shall be an acrylic-based fill coat and shall consist of the following:

White Portland cement: 7.5 kg (16.5 pounds).

Aggregate: 15.2 kg (33.5 pounds).

Mixing liquid: 2.8 L (0.75 gallon).

Potable water: 3.8 L (1.0 gallon) maximum.

Exterior emulsion paint: 3.8 L (1.0 gallon).

3.3.4.2.1. The white Portland cement shall conform to ASTM C 150, Type I. The aggregate shall be washed silica sand of the following gradation:

U.S. Sieve Size	Percent Sand (by Weight) Passing Individual Sieve
20	100
30	95 - 100
50	30 - 65
100	0 - 10
200	0 - 1

3.3.4.2.2. The mixing liquid shall be a factory-prepared acrylic containing 46 to 47 percent solids. The exterior emulsion paint shall be exterior acrylic emulsion paint conforming to Fed. Spec. TT-E-2784, Type III.

3.3.4.3. Paints used on surfaces in areas of high humidity where mildew is possible and on fabric or vapor barrier over insulation shall contain a mildewcide. The mildewcide will not adversely affect the color, texture, or durability of the coating. The mildewcide shall be incorporated into the paint by the manufacturer and shall attain a surface disfigurement rating of 8 or greater when tested in accordance

with ASTM D 3273 and evaluated in accordance with ASTM D 3274. Mercurial mildewcide and insecticides shall not be used in paints.

3.3.4.4. Colors shall be as approved from schemes submitted with proposal. All interior paint surfaces shall be painted off-white. Each proposal shall include three basic exterior and interior color coordinated schemes and color samples. Floor tile, and miniblinds, shall be neutral colors. Final selection of exterior colors will be made by the Installation Commander, (USAG-HI). Exterior color selections shall conform to the Installation Exterior Architectural Plan (IEAP).

All exterior wood trim to include framing members around garage door openings shall be “back-primed” (surfaces that will be inaccessible to field painting after installation of the wood trim shall be primed with one coat of primer before installation).

3.4. Roofing and Drainage. Minimum slopes for existing roofs shall be 1:48 (1/2-inch: 1 ft).

3.4.1. Roof water. Conductor heads, scuppers and downspouts shall be provided for all roof areas. Provide calculation of gutter and downspout size if the existing conductor heads, scuppers and downspout dimensions can not be determined. Calculations should be in accordance with SMACNA-02, Architectural Sheet Metal Manual. Downspouts draining onto a lower roof shall have metal or plastic splash deflectors. Splash blocks shall be provided under downspouts if not connected to the storm drainage system.

3.4.2. Roof surface. Roof surfaces shall be light colored to minimize heat gain. Roof water shall be diverted away from entrances and foundations. Flashing made of nonferrous metal are highly desirable. Splash blocks shall be provided under downspouts not connected to storm drainage system.

3.4.3. Sheet Metal Work. Sheet metal materials, in order of preference, are as follows:

Order of Preference	Sheet Metal Materials
1	Stainless Steel
2	Copper
3	Aluminum
4	PVC (for gutters and downspouts only)

Note: Flashing - Continuous stepped flashing to be installed at wall adjacent to roof slope. Design to facilitate easy maintenance and removal of roofing without removing or damaging the wall sidings. Galvanized sheet metal shall be shop-primed and painted. Provide metal drip edge of flashing at roof eaves.

3.4.4. Conductor heads, scuppers and downspouts shall be adequately sized to meet the following Design Rainfall Intensities:

Schofield Barracks: Design Rainfall Intensity (hourly in inches for a 5-minute period to be expected once in 10 years) = 188 mm (7.4 inches).

3.5. Exterior Finishes. Emphasis shall be placed on low maintenance and durability for exterior finish materials. Materials shall be residential in size, scale, and texture. Exterior wall materials are as follows:

Order of Preference	Exterior Wall Materials
1	Concrete - painted
2	Concrete masonry units (CMU) - painted.
3	Portland cement plaster (stucco)on metal lath with integral colored finish.

4 Exterior Insulation and Finish System/Exterior Finish System.

Note: Other exterior wall materials of equal quality and durability shall be evaluated and their position in the order of preference shall be considered where appropriate.

3.5.1. Termite decay and protection for exterior wood materials (siding, trims, etc.) shall be in accordance with National Wood Window and Door Association (NWWDA) Standards. Each piece of treated material shall bear identification of the testing agency to indicate performance in accordance with NWWDA.

3.5.2. Trim elements. Aluminum or vinyl clad wood trim is preferred over painted or stained wood trim. Painted exterior surfaces shall be minimized. When exterior exposed wood trim is used the following requirements apply:

3.5.2.1. Exposed wood, such as window trim, door sills, window sills, railings and balusters, trellis, wood fencing, arbors, solar shading devices including louvers, arbors, and trellis shall be treated for rot resistance in accordance with NWWDA Industry Standards I.S.4, Water Repellent Preservative Treatment for Millwork.

3.5.2.2. Exterior surfaces requiring painting shall receive a minimum of one prime coat and two finish coats of paint. Wood trim frames, etc., shall be back primed. Exterior semi-transparent low sheen stains, two coats, are acceptable, where appropriate for wood, plywood, etc.

3.5.2.3. Existing exterior stair treads and landings shall be provided with non-slip type treads. Exposed wood rails and trim shall be treated to deter damage from (moisture decay and termite infestation).

3.6. Windows and Doors. Windows and glazed door (50% or more glass) units shall meet the following standards and must be certified by an independent testing laboratory. Windows that slide (double-hung, single-hung, and horizontal sliding) and glass exterior doors shall meet the standards for hung units. Standards for casement windows shall apply to all hinged or fixed windows. Other window types may be used if they have been tested and conform to the standards for hung windows. Window frames constructed of a composite material (blend of wood fiber and thermoplastic polymer) similar or equal to Fibrex® is preferred. The contractor will provide the manufacturer's certification that the window provided meets the following test requirements:

3.6.1. Windows and Sliding Glass Doors.

3.6.1.1. Required Tests. Hung units will meet a National Fenestration Rating Council (NFRC) design pressure rating of 25. Casement windows will meet NFRC design pressure rating of 40. Evidence of passing the following specific tests and minimum standards are required to achieve these design pressure standards.

3.6.1.1.1. Structural Testing. Using ASTM E330, test results shall demonstrate no glass breakage, damage to hardware, or permanent deformation that would cause any malfunction or impair the operation of the unit. Residual deflection of any member shall not exceed 0.4% of its span. Hung windows shall be tested at pressures of 1796 Pa (37.5 lb/ft^2), and casement windows shall be tested at pressures of 2873 Pa (60.0 lb/ft^2).

3.6.1.1.1. Operating Force. The force necessary to unlatch and open units shall not exceed 13.6 k (30 lb) for hung units and 15.9 k (35 lb) for casements.

3.6.1.1.2. Air Infiltration. Using ASTM E283, leakage rate shall not exceed .65 $l/min/m^2$ (0.25 $ft^3/min/ft^2$) for hung units and .39 $l/min/m^2$ (0.15 $ft^3/min/ft^2$) for casements, at a test pressure of 7.66 k/m^2 (1.57 lb/ft^2).

3.6.1.1.3. Water Penetration. Using ASTM E547, no leakage shall be evident when tested in three, five-minute cycles with a one-minute rest period between cycles at 18.3 k/m^2 (3.75 lb/ft^2) for hung units and 29.3 k/m^2 (6.0 lb/ft^2) for casements.

3.6.1.1.4. U-Value. U-values shall be calculated using ASTM E1423, and NFRC 100-91.

3.6.1.2. All windows above the ground floor shall be designed for cleaning both sides of the glass panes from the interior. All windows shall be secured with a positive locking device from the interior.

3.6.1.3. Aluminum windows and trim shall have an architectural class II anodized finish (0.4 to 0.7 mil thick) in accordance with Aluminum Association Standards for Anodized Architectural Aluminum..

3.6.2. Sliding glass doors. Sliding glass doors shall have insulated steel, vinyl clad wood, or thermal aluminum frames conforming to the above requirements. Finish shall be factory applied and conform to 44-C-22431 in accordance with the requirements of the National Association of Architectural Metal Manufacturers (NAAMM) Metal Finishes Manual. Glass shall be laminated. glass. Sliding panels shall be equipped with screens having extruded aluminum tubular frames mitered at corners, channel-shaped corner angle reinforcement and nylon bottom rollers. Doors shall have interior operated latch, and securing pin or throw-bolt in frame. Screening shall be nonferrous.

3.6.2.1. Secondary locking devices shall be provided for all sliding glass doors. Provisions shall be made so that the sliding door cannot be removed from the track when the door is in a locked position. Sliding door shall slide on the inside of the fixed glass panel.

3.6.3. Where glass extends to floor or to within 457 mm (18 inches) of the floor or exterior lockset, it shall be fully tempered safety glass.

3.6.4. 6 mm (¼ inch) thick laminated glass is preferred for all other exterior windows and sliding glass doors. The laminated glass shall consist of two layers of Type I transparent float glass (quality q3, glazing select) conforming to ASTM C 1036. Glass shall be bonded together with 0.76 mm (0.030 inch) thick polyvinyl butyral interlayer under pressure. Glazing for windows at bathrooms shall be patterned or figured.

3.6.5. Interior window stools may be solid-wood, paint-grades with a minimum thickness of 19-mm (3/4-inches). Ceramic tile sills are preferred in masonry construction.

3.7. Screens. Fiberglass screens shall be provided at all operable sashes and sliding doors. Screens shall be nonferrous, of window manufacturer's standard design. Fiberglass insect screens, 18 x 16 mesh size, shall be provided for all windows and sliding glass doors and should be the window or door manufacturers standard design for use with the windows and doors being provided. Insect screen frames shall be removable type for easy cleaning.

3.8. Window Treatments. Provide 25 mm (1 in.) mini-blinds at windows and glazed hung doors. Color shall be manufacturers standard off white, and shall be coordinated with wall color.

3.8.1. Only traverse rods shall be provided at all exterior sliding glass doors. Miniblinds shall be provided for all windows. Solid wood backing shall be provided at all openings for proper anchorage of the traverse rods, and miniblinds.

3.8.2 Miniblinds shall be provided for all other windows not covered under paragraph 3.h.(1) above.

3.9. Exterior Doors. Exterior doors shall be solid core wood (lumber-core only) and shall have exterior glue. Exterior door frames shall be wood or hot-dip galvanized steel with G90 coating. All exterior doors opening to stoops or walks shall be flush. Stoop shall have maximum level change from interior slab IAW UFAS .

9.9.2. Exterior entry doors to utility rooms and mechanical rooms shall be hot-dip galvanized steel with G90 coating.

3.9.3 Interior doors. Interior doors shall be 2050 mm (6 ft -8 in.) in height by 35 mm (1-3/8 inches) thick, hollow core wood. Wood doors will be painted. Interior doors shall be provided in accordance to standard construction and design practices.

3.10. Builders Hardware. Hinges, locks, and latches will comply with the specifications indicated in Table 5-11, and the following subparagraphs.

3.10.1. Entrance door hardware shall be bored-type conforming to ANSI A156.2, Series 4000, Grade 1 for exterior doors, Grade 2 for interior doors.

3.10.1.1. All swinging doors shall have a wall mounted door stop. Hinges acting as door stop or closer and door mounted stops are not acceptable. Provide solid wood backing in the stud wall cavity for wall mounted door stops.

TABLE 5-11 - HARDWARE SPECIFICATIONS

Hardware Type/ Specification	Specific Requirements
Hinges ANSI A156.1	Hinges shall be 115 mm x 115 mm (4-1/2 in x 4-1/2 in) solid brass ball bearing (equal or similar to Stanley FBB179) at exterior doors other than screen doors, and with nonremovable pins or safety studs if outswinging. Hinges shall be 90 mm x 90 mm (3-1/2 in x 3-1/2 in) at interior doors.
Locks & Latches ANSI A156.2	Bored deadlock, Grade 1, at exterior doors. Grade 2 at interior doors. Provide lever handles, aluminum, or stainless steel.
Auxiliary Locks ANSI A156.5	Bored deadlock, Grade 2. Provide matching trim of wrought brass, aluminum, or stainless steel. Provide lever handles.
Interconnected Lock & Latches ANSI A156.12	Grade 2. Provide matching trim of wrought brass, aluminum, or stainless steel.
Closers ANSI A156.4	Series CO2000, Grade 2.
Auxiliary Hardware ANSI A156.16	

3.10.2. Locks and keys. Lock cylinders shall have six pin tumblers and interchangeable cores which are removable by a control key. Provide a master keying system. Locks for each organizational unit, including exterior storage shall be keyed alike. Contractor shall obtain the key bitting report from the hardware manufacturer and provide the report to DPW (Mr. Kimo Kenolio, 656-0644) at the end of the project. Locks and keys shall conform to the standards and requirements of the Builders Hardware Manufacturers Association (BHMA) listed above.

3.10.3. Weatherstripping/Exterior thresholds. Provide nonferrous metal or vinyl weatherstripping for all exterior doors. Vinyl magnetic weatherstripping is acceptable for metal door. Exterior thresholds shall be nonferrous metal.

3.10.4. Applications. Locks and hinges shall be applied as follows:

3.10.4.1. Exterior hinged doors shall have 1-1/2 pair of hinges, lockset, and an auxiliary lock, or interconnected lock and latch, Hinges with loose pins on out swinging exterior doors will be specified with non-removable pins or safety stud.

3.10.4.2. Exterior bulk storage door shall have 1-1/2 pair of hinges and lockset.

3.10.4.3. Doors in fire-rated walls shall have 1-1/2 pair of ball-bearing hinges, lockset, and closer.

3.11. Exterior Railings. Design of exterior railing shall conform to historic character of Quad F. The design shall be coordinated with the State Historical Preservation Office. Exterior railing materials, including bolts and fasteners, in order of preference, are as follows:

Order of Preference	Railing Materials
1	Stainless Steel, Type 316 (bolts and fasteners)
2	Aluminum, Anodized (AA - Architectural Class II; 0.4 to 0.7 mil coating)
3	Galvanized Steel (painted)

Handrail and guardrails shall be designed such that a sphere 102 mm (4 inches) in diameter cannot pass through any of its openings.

4. GENERAL DESIGN - STRUCTURAL.

4.1. Design Criteria. Structural design criteria and guidance are contained in the following documents. Editions that are current at the date of issue of the RFP shall apply.

4.1.1. TI 800-01, Design Criteria

4.1.2. TI 809-01, Load Assumptions for Buildings

4.1.3. TI 809-02, Structural Design Criteria for Buildings

4.1.4. TI 809-04, Seismic Design for Buildings

4.1.5. TI 809-05, Seismic Evaluation and Rehabilitation for Buildings

4.1.6. TM 5-809-3, Masonry Structural Design

4.1.7. TM 5-853-1, Security Engineering, Vols 1-3 (For Official Use Only)

4.1.8. TM 5-855-1, Design and Analysis of Hardened Structures to Conventional Weapons Effects (For Official Use Only)

4.1.9. TM 5-1300, Structures to Resist the Effects of Accidental Explosions

4.1.10. Interim Department of Defense Antiterrorism/Force Protection Construction Standards, with 5 March 2001 Department of Defense paper titled, "Interim Antiterrorism/Force Protection Construction Standards, Guidance on Structural Requirements," and 15 Feb 2000 clarification letter by the Department of the Air Force (For Official Use Only)

4.1.11. Department of Defense Antiterrorism/Force Protection Minimum Construction Standards, DRAFT (For Official Use Only)

4.1.12. MIL HNDBK 1013/1A, Design Guidelines for Physical Security of Facilities

4.1.13. AR 190-11, Physical Security of Arms, Ammunition, and Explosives, with Change 1

4.1.14. EM 1110-2-2002, Evaluation and Repair of Concrete Structures

4.1.15. American Society of Civil Engineers. ASCE 7-98, Minimum Design Loads for Buildings and Other Structures

4.1.16. American Concrete Institute. ACI 318, Building Code Requirements for Reinforced Concrete

4.1.17. American Concrete Institute. ACI Manual of Concrete Practice

4.1.18. American Institute of Steel Construction. AISC Manual of Steel Construction

4.1.19. American Iron and Steel Institute (AISI). Specifications for the Design of Cold-Formed Steel Structural Members

4.1.20. American Welding Society. AWS D1.1, Structural Welding Code, Steel

4.1.21. Unified Facilities Guide Specifications (UFGS).

4.1.21.1. UFGS Section 01452, Special Inspection for Seismic-Resisting Systems

4.1.21.2. UFGS Section 03300, Cast-in-Place Structural Concrete

4.2. Design loads and load combinations, except seismic and blast loads, shall be in accordance with the American Society of Civil Engineers (ASCE) Minimum Design Loads for Buildings and Other Structures, ASCE 7-98. Seismic requirements shall be in accordance with TI 809-04 and TI 809-05. Blast loads are covered under Antiterrorism/Force Protection criteria, References 4.1.7. through 4.1.12 above. Design loads shall meet the minimum load standards shown in Table 4-1.

TABLE 4-1 - MINIMUM LOAD STANDARDS

Load Type	Requirement
Dead Load	Actual
Roof Live Load	1 kPa (20 psf)
Residential Live Load	1.9 kPa (40 psf)
Classroom Live Load	1.9 kPa (40 psf)
Office Live Load	2.4 kPa (50 psf)
Light Storage Live Load	3.5 kPa (70 psf)
Corridors Above First Floor	3.8 kPa (80 psf)
Balcony, First Floor Corridor, Stair, Dining & Serving Rm Live Load	4.8 kPa (100 psf)
Mechanical Room Live Load	7.2 kPa (150 psf)
Kitchen & Dish Washing Live Load	12 kPa (250 psf)
Wind Load	105 MPH Basic Wind Speed,Exposure “C”, in accordance with ASCE 7-98
Seismic Load	Ss = 0.60g, S1 = 0.17g, Seismic Use Group II, Performance Level SE
Antiterrorism/Force Protection	For Official Use Only - Results of AT/FP assessment will be provided to offerors

4.3. Foundation. Foundation shall be concrete footings and/or thickened slab edges compatible with the soil and climatic conditions of the site. See Attachment, Preliminary Soils Investigation Letter Report.

4.4. Slab-On Grade. Non-structural slab-on-grade design shall be in accordance with TI 809-02. Slab-on-grade system shall consist of concrete slab over vapor barrier over granular termite barrier over separation geotextile over capillary water barrier. See Attachment, Preliminary Soils Investigation Letter Report, for details. Welded wire reinforcement shall be secured at mid-depth of slab by mechanical means such as precast concrete spacers or reinforcing chairs. All slabs-on-grade shall be moist cured for a minimum of 7 days followed by curing by curing compound for another 3 weeks. Curing compound shall be dissipating type compatible with any floor seal or floor covering adhesive.

4.5. Wood Construction. Wood structural members are not allowed.

4.6. Reinforced Concrete. Concrete Requirements. All concrete shall conform to ACI Manual of Concrete Practice.

4.6.1. Minimum concrete strength at 28 days: 21 Mpa (3000 psi) with water-cement ratio not more than 0.45.

4.6.2. Minimum concrete thickness:

Slab-on-grade: 102 mm (4 in) thick.

Structural members. The thickness of all structural members shall conform to ACI 318, Building Code Requirements for Reinforced Concrete.

4.6.3. The minimum yield strength (Fy) of reinforcing steel shall be 275 MPa (40,000 psi).

4.7. Concrete Masonry Units (CMU).

4.7.1. Reinforced masonry assemblies shall have a minimum compressive strength of 10.34 Mpa (1500 psi).

4.7.2. Cmu shall conform to ASTM C 90, Type II, except oven-dry weight shall be no less than 581 kg per cubic meter (119 pcf) for hollow load bearing units.

4.7.3. Mortar shall be Type “S” conforming to ASTM C 270.

4.7.4. Grout shall conform to ASTM C 476 with a minimum compressive strength of 15 Mpa (2000 psi).

4.8. Structural Steel.

Structural steel shall conform to ASTM A36 or better.

4.8.2. Anchor bolts shall conform the ASTM A 307. Machine bolts shall conform to ASTM A 325.

4.8.3. All welds shall be accomplished by certified welders in conformance with AWS D1.1, Structural Welding Code.

4.8.4. All steel shall be prime painted in the shop. Exposed steel shall be hot-dip galvanized.

4.9. Light Gage (Cold Formed) Steel Construction. Design and construction shall be in accordance with the AISI Cold-Formed Steel Design Manual.

4.9.1. Fasteners. All screws, bolts, anchor bolts and expansion shields shall be stainless steel or finished with zinc, cadmium or co-polymer coatings. Pneumatically driven pins or nails will not be permitted. All welded connections shall be designed in accordance with Section E of the AISI Specification. All welding shall be accomplished in accordance with AWS D1.3 standards. All weld areas shall be re-touched with the appropriate paint or cold galvanized to retain corrosion resistance.

4.9.2. Protective Coating. Exposed light gage steel members will not be allowed. All light gage steel used for exterior applications shall have minimum G-90 hot dip zinc coating in accordance with ASTM A 525. Exterior applications include all steel members directly supporting exterior siding and roof sheathing. Interior applications shall have a minimum, G-60 hot dip zinc coating in accordance with ASTM A 525.

4.10. Miscellaneous Metal Items. All railings, handrails, anchor bolts, plates, and steel embedded in concrete, metal studs and runners, and other miscellaneous metal items shall be galvanized. All

damaged galvanized areas not embedded shall be repaired with galvanizing repair compound. All metal items listed above that are exposed to the weather or exterior shall be hot-dip galvanized or coated with inorganic zinc primer.

4.11. Materials Testing. As a minimum, the following tests shall be performed. All costs for testing shall be borne by the Contractor.

4.11.1. Concrete. Air content, slump, unit weight, temperature, and strength. Refer to Unified Facilities Guide Specification Section 03300, Cast-in-Place Structural Concrete, for sampling and testing standards.

4.12. Special Inspection. Continuous or periodic special inspection by a certified special inspector shall be performed on seismic-resisting systems. See Unified Facilities Guide Specification Section 01452, Special Inspection for Seismic-Resisting Systems, for inspection requirements and other details.

4.13. Arms Vaults. The arms vault in each Company Operations Facility shall meet the requirements of AR 190-11, Change 1, Appendix G, para G-2. Six (6) each U-shaped anchors out of 21 mm (3/4") diameter, hot-dip galvanized steel rods shall be provided per vault. The U-portion shall be 51 mm (2") high x 70 mm (2 1/2") wide, with a radius of 25 mm (1"). Each leg shall be embedded 76 mm (3") into the slab, ending with a 90 degree bend and a 25 mm (1") return. Where the vault floor is an existing concrete slab, the anchors shall be embedded in drilled holes filled with epoxy. Locations of the anchors shall be coordinated with the user. Each arms vault shall have a daygate mounted just inside the vault door. Daygates shall have a Dutch door with a 300 mm x 450 mm (12" x 18") horizontal steel shelf (writing surface) connected to the top edge of the bottom Dutch door. The 300 mm (12") dimension shall be perpendicular to the door, and the shelf shall be attached flush with the inside face of the door. See other sections for power, telcom, J-SIIDS, air conditioning/dehumidification, water/sprinkler system, and vapor barrier requirements.

4.14. Antiterrorism/Force Protection. Design of this project shall incorporate minimum construction standards set forth in the AT/FP documents listed in References 4.1.7. through 4.1.12. Requirements for major renovations of inhabited structures, and protective measures for troop billeting and primary gathering structures, shall apply. Since the applicable "For Official Use Only" documents are available only to U.S. Government agencies and their contractors, and since a force protection plan is a combination of standoff distances and structural upgrading resulting from planning strategies developed by the designer in concert with the base security planning team, the Government is preparing an independent AT/FP assessment and retrofit report. Expected to be completed o/a the end of May, 2001, this report will be made available to all prospective offerors as an amendment to the RFP. Upon receipt of the report, offerors shall incorporate all retrofit upgrades contained in the report into their design proposal submissions, and include retrofit costs in their price proposal submissions. The AT/FP retrofit upgrades may be integrated with the seismic rehabilitation plan described in the following paragraph, so that strengthened/new structural members may serve dual functions. See also Para 1.3.1, Historical Preservation, for guidelines concerning preservation of this historical structure, and Subsection 2, CIVIL DESIGN, for site upgrades required for A/FP.

4.15. Seismic Evaluation and Rehabilitation. Army regulations require that the buildings of Quad F be evaluated to determine possible requirements for structural rehabilitation to mitigate seismic hazards. The applicable documents are TI 809-05, Seismic Evaluation and Rehabilitation for Buildings, and TI 809-04, Seismic Design of Buildings. Because full seismic evaluation requires destructive testing, and so that risks to offerors due to unknown requirements may be minimized, the Government is preparing an independent seismic evaluation and rehabilitation report. Expected to be completed o/a the end of May, 2001, this report will be made available to all prospective offerors as an amendment to the RFP. Upon receipt of the report, offerors shall incorporate all rehabilitation techniques listed in the report into their design proposal submissions, and include seismic rehabilitation costs in their price proposal submissions. To give the offeror the opportunity for design innovation and economy, the design proposal need not follow the report exactly, provided the seismic forces specified in the report are accounted for in a rational analysis developed by a licensed structural engineer, and load path requirements are met. As

stated in the above paragraph, requirements for seismic rehabilitation may be integrated with requirements for the AT/FP retrofit. See also Para 1.3.1, Historical Preservation, for guidelines concerning preservation of this historical structure.

4.16. Concrete Damage Repair. No major concrete repairs are anticipated. Miscellaneous spalling and cracking shall be repaired following methods prescribed in EM 110-2-2002, Evaluation and Repair of Concrete Structures.

4.17. Existing Structural Systems. Existing structural systems shall be analyzed to insure live loads provided in Table 4-1 can be supported. Buildings shall be reinforced as required.

4.18. Existing structural drawings are provided in Attachments.

5. GENERAL DESIGN - MECHANICAL.

5.1. Energy Conservation.

5.1.1. Design for the these facilities shall comply with the requirements of TI 800-01, Chapter 11. TI 800-01 contains the minimum requirements for energy conservation. Use of alternate energy methods (i.e. solar, wind, cogeneration) will be considered provided that life cycle cost analysis shows that the selected method is the most cost effective. Reliability and past performance track record shall also be considered when evaluating the proposal.

5.1.2. Air Conditioning and Water Heating strategies that increase building energy efficiency beyond the minimum requirements of TI 800-01 will be considered preferred. See Ventilation, and Air Conditioning Section below for discussion on requirement to incorporate existing 600 ton Trane chiller system into this project.

5.1.3 Proposal shall include a brief narrative (3 pages or less) of the energy conservation strategies that the proposer will employ on this project. Sketches may be included. These sketches will not be counted towards the 3 page maximum.

5.2. Ventilation and Air Conditioning: Proposal shall include a brief narrative on what AC and Ventilation strategy will be used for each facility, maximum of 3 pages per facility. Sketches or schematic drawings may be included to illustrate the individual strategies. These sketches or schematic drawings will not be counted towards the 3 page maximum. For Barracks facilities, VAV is preferred if space allows. For all other facilities, central ducted AC is preferred if space allows. Provide AC strategy for Arms vaults separately. Narrative shall include criteria listings - manuals, pamphlets, technical books, codes, industry standards, etc. Narrative shall include a brief description of various items of equipment, including catalog cuts that clearly show which product is to be used. Narrative shall include a description of piping systems including type of pipe, insulation requirements, and whether concealed or exposed, including catalog cuts that clearly show which product is to be used. Narrative shall include a description of the underground chilled water distribution system including type of pipe, including catalog cuts that clearly show which product is to be used. Catalog cuts will not be counted against the 3 page maximum.

5.2.1. Air Conditioning Systems.

5.2.1.1 The existing 600 ton chiller system (chiller, cooling tower, pumps) located in Building 649 were installed in FY2000. This system shall be kept and incorporated into this project. In addition, the existing air handler unit in the chiller plant (serves the chiller room) shall also be kept and incorporated into this project. Project as-built drawings (Hawaiian Electric drawings dated August 2000) have been included in this RFP. Except as discussed here in, these drawings are provided for information. This chiller system supports the chilled water requirements for Quad E and Quad F. The Chilled Water Supply, Chilled Water Return and Chilled Water Reverse Return piping that feeds Quad E must be replaced up to Lewis Street (street between Quads E & F). Provide service valves for this piping that will allow future isolation of Quad E from this system. Sheet M-3 of the Hawaiian Electric drawings shows the existing chiller system. All piping designated on this sheet as existing, that is common to the support of both Quad E and Quad F shall be replaced in kind with new, including the condenser water piping. All piping shown as existing that serves only Quad E shall be replaced in kind with new. Existing chemical treatment system, existing pot feeder system, existing expansion tank system, existing air separator shall also be replaced in kind with new. Chiller plant must remain operational for the duration of the Quad F renovation because this plant serves Quad E. A maximum plant outage of 14 calendar days shall be allowed for the replacement of piping and equipment in the chiller plant. Contractor shall provide written notice to the Contracting Officer of the proposed schedule for the outage a minimum of 8 weeks prior to the proposed outage. Sizing and water distribution strategy within Quad F, including the piping in the plant that serves only Quad F will be the responsibility of the successful proposer. When potable cold water piping system in Quad F is being replaced, contractor is responsible for providing temporary make up water supply to the chiller system until the new potable cold water system is operational and accepted

by the Government. Design and installation of the air conditioning system for all of the facilities within Quad F will be the responsibility of the successful proposer.

5.2.1.2 Design of air conditioning systems shall comply with TI 800-01, TI 800-3, TI 801-1, TI 810-10, TI 810-11, and ETL 1110-3-455 titled, "*Humidity Control for Barracks and Dormitories in Humid Areas"* at a minimum. Except for the existing chiller system, All equipment shall be new. HVAC Control Systems shall be designed in accordance with TI 810-11. Control System shall be BacNet compliant DDC system with the ability to do remote monitoring and control through modem. Existing Trane chiller system shall be tied into the new DDC system and allow for monitoring from the new DDC system at a minimum. Control of the chiller from the new DDC system building control is preferred. Air Conditioning strategy must account for minimizing infiltration of unconditioned outside air into conditioned spaces. All ventilation air strategies for conditioned spaces shall be done in such a manner as to deter the growth of mold and mildew.

5.2.1.3. All Arms Vaults shall be designed to ensure that relative humidity within each vault is maintained at 50% RH +/- 5%. Ventilation air shall be provided for the occupants during hours of operation (assume 3 occupants per vault). It should be noted that vaults are occupied during the day, and that only a barred day gate is locked in the closed position. The vault door remains in open position. This barred day gate potentially allows the unrestricted movement of air in and out of the vault from the Equipment Maintenance area, which could result in poor control of the humidity within the vault. Air conditioning design of the Arms Vaults will need to address this potential problem. Air curtains will not be allowed at the vault door opening. Vault is locked during unoccupied hours. Cleaner Lubricant Protectant (CLP) is used on the weapons within the vault. MSDS for the CLP has been included in this RFP.

5.2.1.4. Underground chilled water distribution systems shall comply with the requirements UFGS 02555A as well as the requirements of the referenced documents in para. 5.2.1.2 above.

5.2.2. Ventilation: Design of ventilation systems shall comply with TI 800-01, TI 800-3, TI 801-1, TI 810-10, and ETL 1110-3-455 titled, "*Humidity Control for Barracks and Dormitories in Humid Areas"* at a minimum and ASHRAE 62. Air Conditioning strategy must account for minimizing infiltration of unconditioned outside air into conditioned spaces. All ventilation air strategies for conditioned spaces shall be done in such a manner as to deter the growth of mold and mildew. Exhaust strategies that minimize or eliminate the need for vertical duct shafts are preferred.

6. GENERAL DESIGN - PLUMBING.

6.1 The entire plumbing system in Quad F shall be removed and replaced. The plumbing system shall be designed and installed in accordance with TI 800-01, TI 800-03, TI 801-1, TM 5-810-5, and the National Standard Plumbing Code (NSPC). Design, installation and testing of the plumbing system shall be in accordance with the National Standard Plumbing Code and Uniform Federal Guide Specification 15400A. Materials and fixtures shall comply with UFGS 15400A. Where required, handicap accessible fixtures shall comply with Uniform Federal Accessibility Standards. Systems which incorporate measures which are designed to increase ease of maintenance or occupant comfort, higher efficiency water heating systems, will be considered preferred.

6.2 When potable cold water piping system in Quad F is being replaced, contractor is responsible for phasing and provision of temporary make up water supply to the chiller system until the new potable cold water system is operational and accepted by the Government.

6.3 Domestic Water Heating System

6.3.1 Sizing of the water heating system shall be in accordance with ETL 1110-3-489 titled "*Domestic Water Heaters for Barracks*". Water heating strategies that are more energy efficient shall be preferred, provided that the life cycle cost for that system shows that it is cost effective.

6.3.2 Proposal shall include a narrative description of the domestic water heating strategy that the proposer intends to use for each facility, 2 page maximum per facility. Narratives shall include criteria listings - manuals, pamphlets, technical books, codes, industry standards, etc. Narratives shall include a brief description of various items of equipment, including catalog cuts that clearly show which product is to be used. Narratives shall include a description of piping systems including type of pipe, insulation requirements, and whether concealed or exposed, including catalog cuts that clearly show which product is to be used. Catalog cuts will not be counted against the 2 page maximum. Proposer may attach sketches or schematic drawings to illustrate each strategy. These sketches or schematic drawings will not be counted against the 2 page maximum. Also describe any preferred items that will be incorporated into the project. Should the proposer choose to use a central domestic hot water production strategy, then the narrative may be 5 pages maximum. Narratives shall include a description of the underground domestic hot water distribution system, if any, including type of pipe, and catalog cuts that clearly show which product is to be used. Should the proposer use desuperheater method as part of the hot water heating strategy, proposal shall be coordinated with Trane Co. to ensure that the desuperheater equipment is compatible with the existing chiller system.

6.4 Pipe shafts will not be allowed in these facilities.

6.5 Sizing of the grease interceptors for this project shall comply with the requirements of the City and County of Honolulu.

6.6 Handling of kitchen waste shall be in accordance with the requirements of the City and County of Honolulu.

6.7 Kitchen equipment shall comply with TI 800-01 and CEGS 11400.

7. GENERAL DESIGN - ELECTRICAL.

7.1 Interior Electrical System

7.1.1. Conformance to Code: The electrical system shall be designed in compliance with the rules and recommendations of ANSI C2, National Electrical Safety Code (NESC) 1997 edition, and NFPA 70, National Electrical Code (NEC) 1999 edition, TI 800-01 Design Criteria, and TI 811-16 Lighting Design.

7.1.2. Electrical Service: Electrical system characteristics for building services shall be 277/480 volts, three-phase, 4-wire, 60 Hertz, grounded neutral.

7.1.3. Overcurrent Protection: Overcurrent protection shall be provided for each feeder. Service entrance equipment for each building shall be grouped together and located in the electrical room. The service entrance equipment shall include sockets for electric watt-hour meters. Provide locking seal on meter socket covers. Meter socket shall be located in an area readily accessible by service personnel. Manual by-pass jumper plates for each socket shall be provided. Meter sockets within a building shall be grouped at one location at the building. Meter sockets shall have a cover plate lock on the locking ring to prevent removal of the locking ring by unauthorized personnel. Service entrance conductors shall be sized in accordance with the National Electrical Code. Service feeders shall be underground.

7.1.4. Loadcenters/Panelboards: Loadcenters/panelboards shall be rated not less than 150 amperes, mounted in the interior walls, and readily accessible. Offset a minimum of 400 mm (16 inches) horizontally back-to-back loadcenters/panelboards. No recessed loadcenters/panelboards are to be located in fire walls. Loadcenters shall have separate neutral and ground buses. Loadcenters/panelboards shall be circuit breaker type installed in painted galvanized steel recessed, dead-front enclosures. Provide at least 25% spare spaces in each loadcenter/panelboard. The Amps Interrupting Current (AIC) rating of loadcenters/panelboards shall be as calculated in the short circuit analysis but shall not be, in any case, less than 10,000 AIC.

7.1.5. Outlet Circuits: Lighting and convenience outlets shall be on separate circuits. Convenience outlets shall be grounded, duplex type, 2 pole, 3 wire, rated 15 amperes at 125 volts, except that outlets provided for specified appliances or equipment shall be of the appropriate type and rating. Receptacles shall be grounded and flush mounted in walls and partitions. All receptacles requiring ground fault protection shall be integral with the receptacle. Outlets on party walls shall be offset 610 mm (24 inches) to maintain integrity of the fire wall and sound deadening rating of the wall. Outlets in Telecommunication Rooms (TR) or closets shall be 2P3W, 20 ampere rated with at least two 20 amp, homerun circuits.

7.1.6. Conduit and Wiring: Conduit and wiring shall not be run in concrete slabs-on-grade. Where runs are below concrete slabs-on-grade and in direct contact with earth or fill, conduit shall be of the coated rigid steel thickvwall conduit, coated intermediate metal conduit or Schedule 40 polyvinyl chloride (PVC) type. Elsewhere, conduit where required shall be either of the galvanized thick-wall conduit, intermediate metal conduit, or electrical metallic tubing (EMT) type, except that EMT shall not be installed in concrete, exposed to the weather or in other wet locations.

7.1.7. Calculations and Drawings: Complete single line diagrams shall be provided with calculations of available short circuits and voltage drops on branch circuits. Lighting calculations shall also be provided. Load calculations for each building shall be provided and conform to Article 220 of the NEC. Illumination levels shall conform to IES standards.

7.1.8. Building Security Lights: Outdoor 70-watt high pressure sodium luminaires shall be provided on the sides of each building to illuminate the perimeter of the building. Quantity and location of fixtures shall be situated to eliminate shadow areas where intruders could remain undetected, yet be coordinated with the architectural features of the structure to minimize spill light into an adjacent building. Luminaires shall be photocell controlled. All luminaires shall be grounded to conform with Article 410 of the NEC and shall be rated for the environment to which the luminaires are exposed. Selection of luminaires shall be

based on energy-savings and aesthetics. Outdoor luminaires shall be UL listed as suitable for wet locations and shall have vandal-proof polycarbonate type lens or otherwise impact resistant plastic lens. All luminaires shall be complete with lamps.

7.1.9. Interior Lighting: The design of interior lighting shall be in accordance with the fundamentals and recommendations of the IES Lighting Handbook, TI 811-16 Lighting Design, and TI 800-01 Design Criteria. See Section on telecommunications for lighting levels in Telecommunication Rooms (TR).

7.1.9.1 Lighting Intensities: Lighting intensities shall conform to those required by the IES and TI 800-01, Chapter 12, table 12-4. The IES intensities were published as minimums for specific tasks. However, the IES intensities shall be considered target design levels not to be changed significantly. The upper lighting levels shall be considered as maximum design levels.

7.1.9.2 Controls: Lighting controls shall be time clock or photoelectric, or both, for general indoor and outdoor lighting. Automatic dimming to supplement day lighting or occupancy sensors may be considered. Dimming systems may be used to reduce voltage and increase lamp life.

7.1.9.3 Efficiency: Interior lighting will be both efficient and color corrected. Color Rendering Index (CRI) of 85 or better and a standard lighting color of 3500 K are required. Fluorescent luminaires shall have rapid start, energy saving, electronic ballasts with sound rating "A". Lamps shall be of low mercury type that meets EPA's TCLP (Toxic Characteristic Leaching Procedure) tests and are classified as non-hazardous waste. For 1220 mm (4 ft) fluorescent light fixtures, provide T8, 32 watt lamps. Polystyrene lens is not acceptable. Acrylic diffusers shall be provided. Recessed fluorescent luminaires shall have 0.026-inch minimum thickness for metal housing. Surface mounted fluorescent luminaires shall have 0.032-inch minimum thickness for metal housing. Luminaires on ceilings less than 2250 mm (7 feet-6 inches) above the floor shall be recessed flush type.

7.1.9.4 Arms Vaults Lighting: Ceiling mounted fluorescent light fixtures shall be provided for the Arms Vaults. The illumination level required for the Arms Vault shall be 75 footcandles (750 Lux).

7.1.10. Smoke Detectors: See section 8. Smoke detectors shall not be located in close vicinity of the bathroom entrance to preclude false alarms. Detectors shall be of the ionization or photo-electric type conforming to the requirements of Underwriters Laboratories Standards No. 217. Detectors shall bear labels, indicating compliance with standards, by a recognized independent laboratory that maintains periodic inspection of production and testing of the detectors provided.

7.1.11. Door Chimes: Push buttons shall be provided at front entrances to each living unit. The system shall include wiring, push buttons, transformer and chimes. System shall be designed for operation at less than 50 volts. Splices in wiring shall be made only where they will be accessible upon completion of the building.

7.1.12. Branch Circuits and Convenience Outlets: Provide a minimum of one general purpose 120 volt, 20 ampere receptacle outlet in each room. In rooms where walls exceed 3 meters, provide an additional duplex outlet for each additional 3 meters of wall or fraction thereof. Receptacle spacing shall not exceed 3 meters. The general purpose receptacles are in addition to the special purpose and dedicated for special equipment. Each LAN workstation shall be provided with an additional well-defined adjacent duplex receptacle on an independent single phase (20 amp, 120 volt) circuit having not more than four duplex receptacles and a non-shared neutral. Where a 20 ampere, 120 volt receptacle is incorporated in the same metal box with a television, or LAN outlet, a partitioned metal box with separate power and signal conduits shall be provided. Provide independent receptacle circuits for FAX and copy machine equipment and laser printers and coordinate the locations with the users. Ground fault circuit interrupter (GFCI) receptacles shall be 15A, 120V w/test and reset button integral with the receptacle. GFCI receptacles shall not be used in "feed thru" applications to protect downstream receptacles on the same branch circuit.

7.1.12.1. Bathrooms: A duplex, ground fault circuit interrupter (GFCI) receptacle shall be provided adjacent to the lavatory. Bathroom receptacle outlets shall be supplied by at least one 20-ampere branch circuit. Such circuit shall not have other outlets.

7.1.12.2. Hallway outside bedrooms. For hallways of 3000 mm (10 feet) or more in length, at least one duplex receptacle shall be provided.

7.1.12.3. Entrance. A weatherproof, duplex, ground fault circuit interrupter (GFCI) receptacle shall be provided near each entrance to each building.

7.1.13. Non-Linear Loads: In all areas where nonlinear load type equipment predominates such as computers, printers, uninterruptible power supply (UPS), motors with variable speed drives, electronic ballasts and dimmers and other similar loads, ETL 1110-3-403, "Electrical Power Systems for Nonlinear Loads" dated 30 June 1989; IEEE Std 1100 "Powering and Grounding Sensitive Electronic Equipment", IEEE Std. 519, "Practices and Requirements for Harmonic Control in Electrical Power Systems" shall be used as design guides. Additionally, the use of 75 or 90 degree C (minimum) terminals and insulated conductors is required and shall be so stated in the project and identified in the RFP documents. Use 75 degree C conductors on circuits with protective device terminals rated for 60 degree C is inappropriate. National Electrical Code (NEC) and Underwriter's Laboratory (UL) rules and instructions shall be followed in applying the ampacity tables in the NEC beginning with Table 31-6. Since virtually all electrical equipment that meets the approval required by article 110-2 of the NEC is UL listed, the equipment must be installed in accordance with UL instructions. The basic rule of the UL Electrical Construction Materials Directory states that, in general, "the termination provisions are based on the use of 60 degree C ampacities for wire sizes No. 14-1 AWG and, 75 degree C ampacities for wire sizes Nos. 1/0 AWG and larger, as specified in table 310-16 of the National Electrical Code." Higher rated conductors than specified may be used if the size is based upon the previous statements. Panelboards and loadcenters serving nonlinear loads shall have double-rated neutral busses. Motors connected to the same power source as nonlinear loads shall be upgraded in size similarly. True RMS sensing meters, relays, and circuit breaker trip elements shall be used with nonlinear loads.

7.1.14. Transformers: Transformers and dielectrics shall be selected and applied in accordance with ETL 1110-3-412 "Transformer Application Guide". For those areas with high nonlinear loads, "K" factor rated transformers are required. Provide a schedule identifying the "K" factor rating for each area. Ratings shall be based upon type of load served. Interior transformers having a primary voltage less than 600 volts shall be of the ventilated-dry-type and shall not exceed 500 kva capacity. Heat load calculation shall be provided to ensure temperature rise is acceptable.

7.1.15. Wiring: Conductors shall be copper. Aluminum conductors are not allowed. Conductors No. 10 AWG and smaller shall be solid, and those No. 8 AWG and larger shall be stranded. Unless indicated otherwise, all wiring, installed in galvanized rigid steel conduit (GRS), intermediate metal conduit (IMC) or electrical metallic tubing (EMT), shall be 600 volts, type THW, THWN, XHHW or RHW, except that grounding wires may be type TW. The wiring methods in the various parts of the facility must be clearly identified on the contract drawings. Underfloor ducts or raceways or raised floors may be used in electronic data processing (EDP) or automated data processing (ADP) rooms or other similar areas when anticipated changes or large equipment requirements justify their use. Underfloor ducts or overhead raceways for electrical wiring and information systems cabling may be provided in administrative areas with requirement too extensive to be served by wall outlets. Remote-control and signal circuits shall be type TW, THW or TF, No. 14 AWG minimum. Service entrance cables shall comply with UL 854. All wiring shall be concealed.

7.1.16. Motors: Motors having a starting current that will cause a 30% transient voltage dip shall have reduced-voltage or current-limiting controllers. The selection of motors and motor controls shall be done in a systematic manner with consideration of the overall efficiency of the system. Motor efficiencies shall meet or exceed the minimum requirements set forth by the Department of Energy where non-proprietary products are available.

7.1.17. Prewired Work Stations: Coordinate early in the design process with the User and the architect concerning the necessary electrical characteristics of the work station wiring systems. In order to facilitate a non-proprietary work station, it may be necessary to provide alternate electrical distribution schemes to match the various methods used in potential supplier's manufactured products. See telecommunications section for telecommunications requirements.

7.1.18. Coordinated Power System Protection: The electrical interior distribution system requires short circuit calculations to ensure proper coordination of the protective devices. This analysis shall be performed in accordance with TM 5-811-14 Coordinated Power Systems Protection. The envelope of coordination for which the proposer is to be responsible must be shown on the drawings and in the design analysis. Special coordination requirements shall be noted on the drawings. Also, situations where complete coordination is not achievable due to device limitations shall also be noted on the drawings and design analysis.

7.1.19. Electronic Security Systems: Electronic security systems shall be designed in accordance with TM 5-853-4 Electronic Security Systems Technical Manual. Arms vaults shall be properly designed for Joint Service Interior Intrusion Detection System (JSIIDS). This limited system is used for interior intrusion detection system (IDS) and consists of a control unit, DTM (a data transmission link such as wire line, fiber optics, coaxial cables, or radio frequency tranmission), balanced magnetic switch, capacitance proximity sensor, grid wire sensor, passive ultrasonic sensor, ultrasonic motion sensor, and a duress sensor.

7.2. Telecommunications Premises Distribution Systems.

7.2..1 Telecommunications Premises Distribution Systems Design: The premises distribution system (PDS) design shall be in accordance with the Department of Army's Installation Information Infrastructure Architecture (I3A), Design and Implementation Guide, dated 19 May 2000 and the local addendum's to the I3A. Features of the premise wiring system are as follows:

7.2.1.1. Prewiring of the building in accordance with Federal and National Standards i.e. Telecommunications Industry Association (TIA) and Electronic Industries Association (EIA) documents.

7.2.1.2. Use of unshielded twisted 8-conductor, 24 AWG, Category 5e, solid conductor, copper cabling throughout the project is required, for horizontal cabling, except where Fiber Optic cabling is used or required. All telecommunications cabling shall be plenum rated with "CMP" on the sheath.

7.2.1.3. Use of distribution devices, such as patch panels or 110 Blocks shall be installedwith wire management devices. RJ21X or 66 Blocks shall not be used.

7.2.1.4. Star wiring architecture from the distribution device is required.

7.2.1.5. A minimum of one horizontal cable shall be installed into each barracks room. Others will provide Service.

7.2.1.6. A minimum of two horizontal cables shall be installed at every outlet. At least one blue sheath/outlet and one green sheath/outlet shall be placed.

7.2.1.7. Category 5e telecommunication jacks shall be configured in the 586A convention.

7.2.1.8. Use of an auxiliary disconnect outlet if necessary

7.2.2. Telecommunications Outlets: Telecommunications outlets shall be 8 position, Category 5e flush mounted type, wired in the T568A configuration. Each outlet shall have the designated number of 8 conductor, Category 5e cables in a concealed 1" or larger EMT conduit. Cabling methods shall comply with the appropriate ANSI/EIA Standard. Cabling and jacks shall be Category 5e and of high quality.

7.2.3. Telecommunications Rooms: An entrance facility will be placed in each building on the ground floor and with an external door. Besides the main entrance, a telecommunications room shall be placed for every 10,000 sf or thereof. All telecommunications rooms or entrance facilities shall be keyed differently and with high security locks, and shall have “Telecommunications” permanently labeled on the door. The minimum TR size shall be in accordance with I3A, ANSI/TIA/EIA-569-A, and the local telecommunications requirements. Four 103 mm (4-inch) conduits with MuleTape shall be extended from the telecommunications entrance facility into the underground telecommunications distribution system and tied off at the first maintenance hole or handhole. Those conduits supporting fiber optic cabling will utilize Maxcell (or equal) and not require MuleTape. The number and size of the telecommunications rooms and entrance facilities shall be coordinated with DOIM’s Infrastructure Management Group.

7.2.4. Conduit and Cabling: Contractor shall provide minimum 25 mm (1") conduits, complete with telecommunications cables and standard T568A modular jack outlets for telecommunications service. Provide each outlet with a cable in conduit routed directly to the telecommunications room. No section of conduit shall contain more than two 90 degree bends between pull points or pull boxes. During cable installation, the rated cable pulling tension shall not be exceeded and cable shall not be stressed such that twisting, stretching, or kinking occurs. Conduit and wiring shall not be run in concrete slabs-on-grade. Where runs are below concrete slabs-on-grade and in direct contact with earth or fill, conduit shall be of the coated rigid steel thickwall conduit, coated intermediate metal conduit or Schedule 40 polyvinyl chloride (PVC) type. Elsewhere, conduit where required shall be either of the galvanized thickwall conduit, intermediate metal conduit, or electrical metallic tubing (EMT) type, except that EMT shall not be installed in concrete, exposed to the weather or in other wet locations. Use of flexible plastic or metallic conduit is prohibited.

7.3. Interior Cable Television System.

7.3.1. Television Outlets: Flush mounted Television (TV) outlets shall be located as required by the user. Outlets shall be Type F female plugs. The outlets shall be prewired and pretested. For RG-11 outlets, use 4” x 4” x 2 ¼” D outlet box w/ ½” minimum rise.

7.3.2. Cabinet: A television terminal cabinet for each building shall be provided and installed in the Telecommunications Room. Coordinate minimum size of cabinet and the type of termination requirements with Oceanic Cable and Verizon Media Ventures. Each terminal cabinet shall be provided with a 19 mm (3/4-inch) termite treated plywood backboard and an insulated #6 AWG copper ground conductor with 900 mm (3 ft) slack in each cabinet. The cable in conduit shall terminate to a common terminal board in the television terminal cabinet or as mutually agreed by Oceanic Cable and Verizon Media Ventures. The cover for the cabinet shall be provided with means for padlocking, and shall be permanently labeled "Television." Final location of the television terminal cabinet shall be coordinated and mutually approved by Oceanic Cable and Verizon Media Ventures. For each building, provide a conduit from the cabinet to the roof of the building as a provision for cable installation from antenna to cabinet by Verizon Media Ventures to preclude Verizon Media Ventures from routing exposed cable. Conduit shall be routed from cabinet concealed in wall up to roof line where it may be routed exposed by penetration of the roof. Coordinate with Verizon Media Ventures and provide appropriate weatherproof transition fitting from conduit to cable.

7.3.3. Conduit and Wiring: For each building, all CATV cable shall be installed in a conduit. For Oceanic Cable and Verizon Media Ventures, 75 ohm, RG-6/U, black, non-messenger, tri-shield, 80% aluminum braid, PVC jacketed coaxial cable shall be used for cable lengths under 200 ft. For cable lengths greater than 200 ft, the CATV cable shall be 75 ohm RG-11/U, bonded foil, shielded type which includes an inner layer of laminated tape of aluminum foil bonded to the conductors insulation with a layer of adhesive plus 60% aluminum braid, PVC jacketed coaxial cable. Conduit and wiring shall not be run in concrete slabs-on-grade. Where runs are below concrete slabs-on-grade and in direct contact with earth or fill, conduit shall be of the coated rigid steel thick-wall conduit, coated intermediate metal conduit or Schedule 40 polyvinyl chloride (PVC) type. Elsewhere, conduit shall be either of the galvanized thick-wall conduit, intermediate metal conduit, or electrical metallic tubing (EMT) type, except that EMT shall

not be installed in concrete, exposed to the weather or in other wet locations. Use of flexible plastic or metal conduits are prohibited. All CATV conduit shall be concealed. Type of cable, type of tap-offs or splitters, and outlet boxes shall be coordinated with Oceanic Cable and Verizon Media Ventures. The following is Oceanic Cable conduit capacity guidelines: ¾"C = 1 to 2 each RG-6 w/pullwire, 1-1/4"C = 1 to 4 each RG-6 w/pullwire, 1-1/2"C = 1 to 5 each RG-6 w/pullwire.

7.3.4. All inside wiring shall be identified and tagged with the building number, room, and outlet designation. All inside wiring shall be homerun from the backboard/TV cabinet in the Telecommunication Room to the TV outlet in the room. Refer to RFP drawings for Typical Riser Diagram.
7.3.5 The proposer is advised that if the CATV equipment is located in a room accessible to the building occupants, Oceanic requires CATV cabinets. Oceanic will provide CATV cabinets to the proposer and the proposer shall install. If the CATV equipment is to be located in a secured locked room not accessible to the building occupants, Oceanic will place the necessary CATV equipment on the proposer provided backboard and CATV cabinets will not be required in this case. Also note that duplex 4" square receptacles are required at the CATV cabinet or backboard. The number of receptacles is to be determined by Oceanic upon reviewing the plans. If multiple receptacles are needed, space receptacles 6" to 8" apart. Refer to Attachment "Exist CATV Equipment for Bldg 649" and "Exist CATV Equipment for Bldg 650, 651, and 652".

7.3.6. Coordination with Oceanic Cable and Verizon Media Ventures: The Contractor is advised that both Oceanic Cable and Verizon Media Ventures require drawings to be submitted for approval which show at a minimum, locations of outlets and boxes, routes, types and sizes of supporting facilities. The Contractor is also advised that these companies may decline to review drawings which they consider inadequate in detail. The Contractor shall be responsible for coordinating with Oceanic Cable and Verizon Media Ventures to ensure what is proposed meets all their requirements. If any of Oceanic Cable and Verizon Media Ventures requirements are not met, the Contractor shall provide what is required at no cost increase to Oceanic Cable, Verizon Media Ventures, and/or the Government. The Contractor shall provide one week notice before conduit installation begins. Oceanic Cable point of contact is Mr.Dean Yonezawa, (808) 625-8456; Verizon Media Ventures point of contact is Mr. Richard Filanc, (808) 832-6590.

7.4 Exterior Electrical Distribution System

7.4.1. General: TM 5-811-1, Electrical Power Supply and Distribution provides baseline design criteria, standards, policy and guidance for the design of the electrical power supply and distribution systems. Designs shall be compatible with existing construction provided this does not conflict with criteria, standards and policy in TM 5-811-1.

7.4.2. Codes: Electrical systems and installation requirements shall adhere to the current editions of ANSI C2, National Electrical Safety Code, NFPA 70, National Electric Code, and TM 5-811-1 Electrical Power Supply Distribution. In addition, transformers shall be installed in accordance with the guidance provided in MIL-HDBK 1008C, Fire Protection for Facilities Engineering, Design, and Construction.

7.4.3. Standards: All equipment, materials and appurtenances provided under this contract shall be suitable for the intended application and shall conform to the current edition of applicable standards of one or more of the following:

National Electrical Manufacturer's Association
American National Standards Institute
Insulated Power Cable Engineers Association
American Society for Testing and Materials
Institute of Electrical and Electronics Engineers.
Underwriters' Laboratories, Inc.

Where no such standards exist for any product provided under this contract, the Contractor shall demonstrate the suitability of the product, for the application intended, to the satisfaction of the Contracting Officer.

7.4.4. Grounding: All exposed non-current carrying metallic parts of electrical equipment, metallic raceway systems, grounding conductors and the neutral conductor of the wiring system shall be grounded, except where specifically indicated otherwise. The ground connection shall be made as required by Article 250 of the NEC. Where ground rods are required, they shall be 19 mm (3/4-inch) by 3000 mm (10-foot) copper-clad steel driven so the top is 150 mm (6 inches) below grade. Rods shall be tested for compliance with NEC ground resistance requirements prior to connection.

7.4.4. Locks: All enclosed electrical equipment shall be equipped with padlocks and furnished with two keys with each lock. All locks shall be master keyed.

7.4.5. Ducts: A minimum of one spare duct shall be provided for each duct line. Duct lines shall not pass beneath any building structures. Similarly, building structures shall not be constructed over any duct line. Primary conductors shall be in concrete encased thin-wall PVC ducts, routed through manholes. Electrical secondary, telephone, and cable television cables or conductors shall be non-encased direct burial ducts, except those ducts installed under roads or concrete driveways or other paved areas exceeding 1524mm (5 feet) in width which shall be encased with a minimum of 76 mm (3 inches) of concrete around each duct. Such encasement shall extend a minimum of 1524 mm (5 feet) beyond the edge of the road or paved area. Provide duct seal for where cable enters ducts and covers on spare duct openings. Field cuts requiring tapers shall be made with proper tools and match factory tapers. After an electrical duct line is completed, a standard flexible mandrel shall be used for cleaning followed by a brush with stiff bristles. Mandrels shall be at least 12 inches along and have diameters ¼ inch less than the inside diameter of the duct being cleaned. For telecommunication ducts, the size of the mandrel shall be as DOIM specifies. For cable television ducts, a rigid 12 inch mandrel with diameter ¼ inch less than the inside diameter of conduit shall be used for ducts larger than 53 mm (2 inch). A flexible mandrel with a diameter ¼ inch less than the inside diameter of conduit shall be used only for 53 mm (2 inch) ducts. Mandrels shall be provided by Oceanic Cablevision only for final testing of CATV ducts. A coupling recommended by the duct manufacturer shall be used whenever an existing duct is connected to a duct of different material or shape. If burrs or obstructions are encountered in electrical, telecommunication, or cable television ducts, that section of the duct shall be replaced.

7.4.5.1. Concrete Encased Ducts: The encasement shall be a minimum of 76 mm (3 inches) of concrete around each duct. Separators or spacing blocks shall be made of steel, concrete, plastic, or a combination of these materials placed not further apart than 1219 mm (4 feet) on centers. Ducts shall be securely anchored to prevent movement during the placement of concrete and joints shall be staggered at least 152 mm (6 inches) vertically.

7.4.5.2. Nonencased Direct Burial Ducts: Where bottoms of trenches comprise materials other than sand or stone-free earth, 76 mm (3-inch) layers of sand or stone-free earth shall be laid first and compacted to approximate densities of surrounding firm soil before installing ducts in direct-contact tiered fashion. Joints in adjacent tiers of duct shall be vertically staggered at least 152 mm (6 inches). The first 102 mm (4-inch) layer of backfill cover shall be sand or stone-free earth compacted as previously specified. High-tiered duct banks shall use a wooden frame or equivalent form to hold ducts in alignment prior to backfilling. Selected earth at duct banks shall be thoroughly tamped in 102 mm to 152 mm (4- to 6-inch) layers. Burial depth of non-encased ducts for cables with a rating of 600 volts or less and for telephone/television cables shall be a minimum of 610 mm (24 inches). Where non-encased ducts for telephone/television cables share the same trench with ducts for secondary cables with a rating of 600 volts or less, the ducts shall be separated not less than 305 mm (12 inches).

7.4.5.3. Duct Line Markers/Plastic Marking Tapes: Duct line markers shall be provided at the ends of long duct line stub-outs or for other ducts whose locations are indeterminate because of duct curvature or terminations at completely below-grade structures. A 5-mil brightly colored plastic marking tape not less than 152 mm (6 inches) in width and suitably inscribed at not more than 3048 mm (10 feet) on centers

with a continuous metallic backing and a corrosion resistant 1-mil metallic foil core to permit easy location of the duct line, shall be placed approximately 305 mm (12 inches) below finished grade levels of such lines.

7.4.6. Conductors: All conductors shall be copper.

7.4.7. Nameplates: Each primary circuit breaker, secondary switchboard or switchgear, and secondary circuit breaker panel shall be identified with a laminated phenolic plastic nameplate. Each primary and secondary feeder shall be identified with a fiber or a non-ferrous metal tag.

7.4.8. Point of Connection: The electrical point of connection for Quad F shall be an existing manhole located at the corner of Waianae Avenue and Lewis Street. Please refer to RFP drawings for exact location.

7.4.9. Outages: The Contractor shall initiate requests for outages no less than 45 calendar days prior to any interruption of service in the existing electrical system. Written requests shall be forwarded to DPW via the contracting Officer. Switching shall be performed by DPW authorized personnel.

7.4.10. System Design: Provide new electrical distribution system as necessary and connect to the existing primary electrical system. The distribution system shall be underground for both primary and secondary conductors. The primary system shall be a radial feed and shall be compatible with the system of which it becomes an extension. Loads on the primary system shall be distributed evenly on the three electrical phases. A multiple grounded neutral conductor shall be routed with the phase conductors. Tag all cables to identify phases. All electrical materials and equipment shall be rated for future operation at 12.47 kV, although the current operation shall be at 6.8 kV line-to-line. The existing nominal system is 7.2 kV, 3-phase, delta with grounding transformers at the Base substation. New distribution systems and extensions of existing system shall provide for proper coordination of protective devices. Coordination studies shall be part of the design analysis. Refer to TM 5-811-14, Coordinated Power Systems Protection for guidance on protective coordination studies and the selection of protective devices.

7.4.11. Calculations and Diagrams: Complete single line diagrams shall be provided with calculations of available short circuit currents at each transformer and circuit breaker panel; loads on all transformers and feeders; and voltage drops on primary lines and secondary services. Illumination and uniformity calculations for multipurpose courts shall also be provided. Diagrams, calculations, and drawings shall be prepared under the supervision of a United States registered professional electrical engineer.

7.4.12. Voltage Drops: The length of secondary distribution service laterals from the unit substation to the building service entrances shall be minimized. The voltage drop from the unit substation to each building's service entrance equipment shall not exceed 3%. The voltage drop from the service entrance equipment to the farthest outlet of lighting, power, or combination of such loads shall not exceed 5%.

7.4.13. Demand Loads: A separate demand load calculation shall be provided for each building. Include catalog cuts of the electrical data for the HVAC equipment that was selected by the mechanical engineer.

7.4.14. Primary Cable: Primary cable shall be ethylene propylene rubber insulated, polyvinyl chloride jacketed, 25% copper tape shield overlap. Conductors shall be copper; sizes larger than no. 8 AWG shall be stranded. Cables shall have a voltage rating of at least 15 kV with 133 percent insulation level. Cable shall be #2, #4/0, or 250 kcmil standard sizes. Deviations from these sizes shall be coordinated and approved by Mr. Roger Grace, DPW, phone no. 655-2942, ext. 3011.

7.4.15. Underground Splices: Splices shall be in self-draining, rodent-resistant manholes with traffic rated covers. Primary cable shall be installed without splice in runs of 152 meters (500 ft) or less. "Y" and "T" splices shall not be used. The maximum spacing between manholes shall be 91 meters (300 ft). Primary cables shall be fire-proofed for their entire length within a manhole on an individual cable basis.

Fireproofing shall extend at least 25 mm (1 in) into the ducts. Systems shall be listed as a fire protective coating for grouped electrical conductors and shall be suitable for application on the type of medium voltage cables provided. After fully cured, the installation shall be suitable for use where exposed to oil, water, gases, salt water, sewage, and fungus whereby no resulting damage to cable or insulation shall occur.

7.4.16. Secondary Conductors: Secondary underground cables shall conform to UL 854 and shall be copper, type RHH-RHW-USE insulation, cross-linked polyethylene or ethylene-propylene-rubber outer covering. Conductors shall be installed in non-encased PVC thick wall ducts and where practical, located below sidewalks. Secondary cable splices shall be made in splice boxes approved for the purpose and in accordance with the manufacturer's recommendations.

7.4.17. Service Entrance: Only one service entrance per building shall be provided.

7.4.18. Secondary Unit Substation: The unit substation shall be of the outdoor type having the ratings and arrangements that are compatible and suitable for proper operation of the facility. Medium voltage ratings of cable terminations shall be 15 kv between phases for 133 percent insulation level. Provide two primary feeders to the unit substation for back-up or maintenance purposes. Where secondary feeders exit the unit substation, provide tags to indicate building numbers. Pad for the unit substation shall be concrete. The unit substation shall have “Danger High Voltage” signs affixed to all four sides of the enclosure. The new unit substation shall be located in the same location as the existing and shall be accessible to service personnel for maintenance operations. Area surrounding the unit substation shall be appropriately landscaped to aesthetically blend the unit substation into the neighborhood. When necessary, architectural screening may be used to provide a pleasing appearance but the screening must assure no loss in equipment efficiency. Secondary unit substations shall comply with ANSI C37.121 and shall be of the radial type. The new substation shall be sub-assembled and coordinated by one manufacturer and shall be shipped in complete sections ready for connection at the site. Complete sections shall include incoming, transformer, and outgoing sections and, where practicable, shall be shipped as one unit. Enclosures shall be corrosion resistant stainless steel construction with a factory applied Norwood Brown color, Federal Color No. 10045.

7.4.18.1. Incoming Section: Metal-enclosed interrupter switchgear consisting of fused, air-insulated interrupters in series with automatic, visible blade disconnects shall be provided for protection of incoming circuits. Metal-enclosed interrupter switchgear shall comply with IEEE ANSI/IEEE C37.30 for load-interrupter switches, NEMA SG-2 for power fuses and shall be of the outdoor no aisle type that meets or exceeds the requirements of the applicable publications listed. Switch construction shall be of the manually-operated, “OPEN-CLOSED” air insulated load interrupter type equipped with a stored energy operator for quick-make quick-break to make operating speeds independent of manual switch operations. Suitable bus or lug connections shall be provided to mount slip-on medium voltage cable terminations for cable entering via conduit from below. Fuses shall be of the current limiting type. Fuses shall be sized approximately 150 percent of the transformer full load current rating. Three sets of spare fuses shall be provided to DPW. Identify the following switch ratings in the design and specifications:

a). nominal voltage,
b). rated maximum voltage,
c). maximum symmetrical interrupting capacity,
d). maximum asymetrical interrupting capacity,
e). 3-second short time current carrying capacity,
f). rated continuous current, and
g). BIL.

Unless otherwise approved by DPW, manufacturer’s standard devices shall be provided and shall include but not limited to the following:

a). A switch-operating handle with provisions for locking in the open or closed position.
b). A switch mechanical position indicator

c). A key interlock if required.
d). An interface terminal block wired for required exterior connections.

7.4.18.2. Transformer Section: Transformers shall have two separate windings per phase and shall be of the mineral oil-insulated type with high molecular-weight hydrocarbon liquid. Transformers shall be suitable for outdoor use. Liquid-insulated transformers shall comply with IEEE ANSI/IEEE C57.12.00, ANSI C57.12.13 and ANSI C57.12.27 and shall have two 2-1/2 percent full capacity taps above and two 2-1/2 percent full capacity taps below rated voltage. Transformers shall be of the sealed tank type construction with weld-on cover. Accessories shall include a pressure-vacuum gauge, dial type thermometer with alarm contacts, provisions for jacking, lifting, and towing. Transformers shall be sized larger than 10-25% more than the calculated loads.

7.4.18.3. Integral Outgoing Section: Integral outgoing section shall be of the dead-front distribution panelboard/switchboard type or metal-enclosed switchgear type. Each circuit breaker and auxiliary compartment shall have a suitable metal or laminated plastic nameplate with white cut letters at least ¼ inch high on contrasting backgrounds. The panelboard/switchboard type shall be mounted integrally with the transformer and shall consist of metering devices and main and branch circuit breakers mounted in panelboard/switchboard enclosures. Panelboards shall comply with NEMA PB 1. Switchboards shall comply with NEMA PB 2. The metal-enclosed switchgear type shall be of the metal-enclosed drawout circuit breaker type in accordance with IEEE ANSI/IEEE C 37.20.1 and NEMA SG 5. The main secondary bus of each outgoing section assembly shall include a watt-hour demand meter with the necessary instrument transformers and VT and CT test blocks.

7.4.19. Area Lighting: Area lighting shall be provided at intervals not exceeding 52 m (170 ft) along area walkways not otherwise illuminated, common area walks connecting picnic areas, and at all steps in area walkways. Area lighting shall be provided with HPS lights. Illumination levels and uniformity ratios shall be in accordance with the IES Lighting Handbook. Luminaries shall be actuated by photoelectric control, one photocell per circuit, and supplied from multiple circuits. Light fixtures shall have vandal-resistant polycarbonate type lens and shall be mounted on seamless aluminum poles. Lights, poles, and anchoring shall be designed to withstand a wind loading of 100 MPH.

7.4.20. Roadway Lighting: Existing roadway lighting shall be removed and new roadway lighting shall be provided when Foote Avenue is realigned between Glennan Street and Meigs Street. 250 watt HPS fixtures shall be provided at each roadway intersection and 100 watt HPS lights at intervals not exceeding 170 ft between intersections. Coordinate with DPW on the exact type of fixture to be used. POC is Mr. Roger Grace, 655-2942, ext. 3011.

7.4.21. Parking Lot Lighting Adjacent to Bldg 651 - Existing parking lot lighting shall be reused and reconnected to the new electrical distribution system for Quad F. Refer to RFP drawings for location.

7.4.22. Parking Lot Lighting Across Bldg 650 and along Foot Avenue - Provide new parking lot lighting and connect to the new electrical distribution system for Quad F. Lighting levels and uniformity ratios shall be in accordance with the IES Lighting Handbook. Luminaries shall be actuated by photoelectric control, one photocell per circuit, and supplied from multiple circuits. Light fixtures shall have vandal-resistant polycarbonate type lens and shall be mounted on seamless aluminum poles. Lights, poles, and anchoring shall be designed to withstand a wind loading of 100 MPH. Refer to RFP drawings for location.

7.4.23. Gear Wash/Recreational Facility: Provide general lighting and electrical power for the facility.

7.4.24. Multipurpose Court Lighting: Illumination levels and uniformity ratios shall be in accordance with IES Lighting Handbook for recreational (outdoor) classification. Lamps shall be metal halide for better color rendition. Luminaries shall be actuated by a permissive switch and supplied from a three phase circuit. Light fixtures shall have vandal-resistant polycarbonate type lens and shall be mounted on seamless aluminum poles. Lights, poles, and anchoring shall be designed to withstand a wind loading of 100 MPH.

7.4.25. Metering: Enclosed meter sockets shall be provided for each building having a connected load of 250 kva or more to permit check metering. Enclosures shall be corrosion resistant stainless steel construction with a factory applied Norwood Brown color, Federal Color No. 10045.

7.4.26. Operation and Maintenance (O & M) Manuals: Operation and Maintenance manuals shall be provided for the secondary unit substation. Manuals shall instructions for assembly, installation, operation and maintenance, and spare parts data which provides supplier name, current cost, catalog order number, and a recommended list of spare parts to be stocked. Manuals shall also include data outlining detailed procedures for system startup and operation, and a troubleshooting guide which lists possible operational problems and corrective action to be taken. A brief description of all equipment, basic operating features, and routine maintenance requirements shall be included. Documents shall be bound in a binder marked or identified on the spine and front cover. A table of contents page shall be included and marked with pertinent contract information and contents of the manual. Tabs shall be provided to separate different types of documents, such as catalog ordering information, drawings, instructions, and spare parts data. Index sheets shall be provided for each section of the manual when warranted by the quantity of documents included under separate tabs or dividers. Six copies of these O & M manuals shall be submitted within 7 calender days following the completion of tests.

7.5 Telecommunications Outside Plant.

7.5.1. Point of connection: Infrastructure: Maintenance Hole C7, Fiber Optic Cables: Bldg 550, AND, and Copper Cables: Bldg 255, Main Distribution Frame.

7.5.2. The telecommunications cable and duct distribution shall be underground within the project site. The telecommunications distribution system shall be physically separated from the electrical power distribution system in accordance with the NESC. Exterior telecommunication cables shall be furnished and installed by others. The Contractor shall coordinate with DOIM, through Mr. Edmund Takeya at 438-0189, Infrastructure management Group and Mr. Marion F. Robinson, Jr. at 438-8071 ot Mr. James W. Arrowood, to ensure all proposals, designs, and installation requirements meet Federal and local telecommunications standards at the sole expense of the contractor. In addition, the Contractor shall coordinate with Mr. William Aiu, AT&T HITS, to ensure existing telecommunications cables are properly attended to prior to starting building renovation. This coordination shall be required again toward the end of the project to ensure telecommunications cervices are available at facility turn over.

7.5.3. The Contractor shall be responsible for coordinating with DOIM to ensure what is proposed meets Federal and local PUC requirements. If any requirements are not met, the Contractor shall provide what is required at no increase to the Contract price or time of performance.

7.5.4. The Contractor is cautioned that DOIM requires drawings to be submitted which show, at a minimum, locations, routes, types, and sizes of the supporting facilities for the telecommunications system. The Contractor is also advised that DOIM and the commercial vendor may decline to review drawings which it considers inadequate in detail.

7.5.5. ANSI/TIA/EIA 569A Commercial Building Standard for Telecommunications Pathways and Spaces shall be used for maintenance hole, handhole and conduit design. The underground telecommunication system design must also conform to Verizon “Standard Specifications for Placing Underground Telephone System”. Federal standards or local practices shall be the minimum requirement. Commercial vendor products may be used, if they meet or exceed the Federal Standards.

7.5.6. In addition to the requirements stated above, the following shall be provided as a minimum:

7.5.6.1. Details of conduit termination to telecommunications lines on an existing pole or maintenance hole at the point of connection (aerial to underground or underground to underground).

7.5.6.2. Sizes, quantities, type, and locations of handholes, maintenance holes and ducts with MuleTape.

7.5.6.3. Termite treated backboards and insulated copper, #6 AWG, ground conductors shall be provided in each telecommunications room. The ground conductor shall be connected to an ANSI/TIA/EIA compliant busbar in each room. Telecommunications grounding shall meet TIA/EIA-607-1995.

7.5.6.4. Minimum conduit size for distribution cabling shall be 103 mm (4 inches). Conduits shall be PVC, Schedule 40, encased in 2500 psi concrete. Burial depth shall be, at a minimum, 600 mm (24 inches) measured from the top of the duct. At least one spare 103 mm conduit shall be provided for each distribution pathway. A minimum of two spare 103 mm conduits shall be provided for each trunking pathway. All 103 mm conduits shall have Muletape installed except for those conduits supporting fiber optic cabling. Thes conduits shall utilize Maxcell (or equal) inner ducts. The number and thread color shall be coordinated with DOIM's Infrastructure Management Group, Fiber Optic Manager.

7.5.6.5. Maintenance holes shall be equipped with two pulling-in iron and cable racks with arms. Maximum spacing for manholes shall be 152 m (500 feet). Maximum spacing between handholes and between handholes and buildings shall be 45.5 m (150 feet). All maintenance holes, and handholes shall be provided with 2400 mm (8 foot) ground rods. All handholes shall be located in sidewalks and all maintenance holes shall be located in roadways.

7.5.6.6. All inside and outside cabling shall be identified and tagged at the terminal, outlet, and at each termination and maintenance hole in accordance with ANSI/TIA/EIA 606-1994, and local numbering conventions, with the following minimum information: a) building and floor number, b). room and outlet designation, and c) cable pair, pair count, AWG.

7.5.6.7. The Contractor is required to follow Federal, Army and Hawaii PUC technical guidance as part f this project. Any deviations shall be coordinated through the DOIM's subject matter experts who will coodinate with local service providers. Point of contact at DOIM is Mr. Edmund Takeya at 438-0189. Subject matter experts in the Infrastructure Management Group are Mr. Marion F. Robinson, Jr. at 438-8071 or Mr. James W. Arrowood at 438 8070.

7.6 Exterior Cable Television System

7.6.1. Point of connection: **For Bldgs 650 and 651, the point of connection shall be an existing telecommunication handhole adjacent to Bldg 651. From this handhole, the proposer shall run new underground ducts to Bldg 650 and remove the existing aerial service. Reuse existing ducts to Bldg 651. For Bldgs 649 and 652, the point of connection shall be an existing telecommunication handhole adjacent to Bldg 649. From this handhole, the proposer shall run new underground ducts to Bldg 652 and remove the existing aerial service. Reuse existing ducts to Bldg 649. Refer to Attachment, "CATV Point of Connection".**

7.6.2. Space provisions (empty conduits) shall be made, for installation of an underground television cable system. Cables will be furnished and installed by others. Mule tape shall be provided in all empty conduits to facilitate pulling of cables by others. The underground cable television distribution system shall be physically separated from the electrical distribution system in accordance with NESC (ANSI C2). All design and installation requirements shall be coordinated with Oceanic Cable at the sole expense of the Contractor.

7.6.3. The Contractor is cautioned that Oceanic Cable requires drawings to be submitted which show, at a minimum, locations, routes, types, and sizes of the supporting facilities for the television system. The Contractor is also advised that Oceanic Cable may decline to review drawings which it considers inadequate in detail.

7.6.4. The Contractor is advised that Oceanic Cable has standard drawings for the pull boxes, manholes, handholes, and ductlines. The Contractor may contact Oceanic Cable regarding their

standard specifications. The point of contact is Mr. Dean Yonezawa, Oceanic Cable, phone number (808) 625-8456.

7.6.5. The Contractor shall coordinate with Oceanic Cable to ensure what is proposed meets all of that company's requirements. If any requirements are not met, the Contractor shall provide what is required at no increase to the Contract price or time of performance.

7.6.6. The Contractor must provide 1 week notice before conduit installation begins. Point of contact shall be Mr. Moki Place, Oceanic Cable, phone number (808) 625-8378.

7.6.7. In addition to the requirements stated above, the following shall be provided for Oceanic Cable's approval.

7.6.7.1. Details of conduit termination to Oceanic Cable lines on an existing pole or manhole at the point of connection (aerial to underground or underground to underground).

7.6.7.2. Sizes, quantities, type, and locations of pullboxes, handholes, manholes, and ducts with mule tape. May include power supply with secondary as needed.

7.6.7.3. Sizes and types of terminal cabinets required at each building. A termite treated backboard and insulated copper, #6 AWG, ground conductor shall be provided in each cabinet. The ground conductor, with 900mm (3-feet) excess length in each cabinet, shall be connected to the building grounding system. Cabinet enclosures shall be rated NEMA 3R.

7.6.7.4. Minimum duct size for distribution lines shall be 102 mm (4 inches). Ducts shall be PVC schedule 40 when concrete encased and when direct buried. If practicable, locate below the sidewalks. Burial depth shall be 600 mm (24 inches). Mule tape shall be provided in each duct. See other paragraphs for burial depth and concrete encasement requirements.

7.6.7.5. Maximum spacing of pullboxes/handholes shall be 108m (350 feet). All handholes/pullboxes shall be located in sidewalks and/or planter strips. Maximum distance for CATV service drop cables shall not exceed 150 ft from the Building’s terminal cabinet to the pullbox containing the main CATV distribution cables. Exceptions to this requirement will require approval from Oceanic Cable.

7.6.7.6. Minimum duct size to the building shall be 53 mm (2 inches). Ducts shall be PVC Schedule 40 when concrete encased and when direct buried. Mule tape shall be provided in each empty duct.

7.6.7.7. Where applicable, sizes and locations of power supply pullbox shall be as recommended by Oceanic Cable. Power supply, box, pad, and pedestal shall be provided by Oceanic Cable.

7.6.8. Pullboxes: A 600 mm (24 inch) by 1200 mm (48 inch) CATV pullboxes shall be used for this project if necessary. See RFP drawing “24 IN x 48 IN PULLBOX DETAIL”. Pullboxes shall be precast concrete with polymer non-skid surfaced two piece covers inscribed with “TV”. A minimum of two precast concrete pullbox sections shall be required at each pullbox.

7.6.9. Terminal Cabinets. Terminal cabinets shall be provided. Incoming ducts to the building main terminal cabinet shall be 53 mm (2-inch) PVC schedule 40 when concrete encased and when direct buried.

7.7. Special Utilities and Supplementary Construction. Required connections to the existing utilities shall be completed by the Contractor at no increase to the Contract price even if they are beyond the indicated project boundaries. The Contractor shall coordinate the installation of telephone and cable TV feeders from the points of connection to the buildings with DOIM, Oceanic Cable, Verizon and Verizon Media Ventures, respectively. Connection, pulling, and installation of wire will be done by the respective utility company. The cost of pulling, installation, and connection shall be included in the Contractor's proposal.

7.7.1 Electronic Security Systems. Electronic security systems shall be designed in accordance with TM 5-853-4, Electronic Security Systems Technical Manual. Arms Rooms shall be properly designed for Joint Service Interior Intrusion Detection Systems (JSIIDS). This limited system is used for interior intrusion detection systems (IDS) and consists of a control unit, DTM (a data transmission link such as a voice telecommunications circuit, fiber optics, coaxial cables, or radio frequency transmission), balanced magnetic switch, capacitance proximity sensor, grid wire sensor, passive ultrasonic, ultrasonic motion sensor, and a duress sensor. Telecommunications Entrance Facilities shall have JSIIDS on their doors.

7.8 Cathodic Protection System: Cathodic Protection (CP) is mandatory on buried ferrous metallic structures as described below:

7.8.1. CP systems must be designed to provide protective potential to meet the requirements of the National Association of Corrosion Engineers (NACE) Standard RP-0169, Control of External Corrosion on Underground or Submerged Metallic Piping Systems, or NACE Standard RP-0185, Control of External Corrosion on Metallic Buried, Partially Buried, or Submerged Liquid Storage Systems as appropriate.

7.8.2. CP and protective coatings shall be provided for the following buried/submerged ferrous metallic structures regardless of soil or water resistivity:

7.8.2.1. Natural gas and propane piping

7.8.2.2. Fire protection piping.

7.8.2.3. Other structures with hazardous products as identified by the user.

7.8.3. Cast iron pipe shall be treated as follows:

7.8.3.1. For soil resistivity below 10,000 ohm-cm at pipeline installation depth, provide CP, bonded joints, and protective coatings.

7.8.3.2. For soil resistivity between 10,000 and 30,000 ohm-cm at pipeline installation depth, provide bonded joints only.

7.8.4. Copper water service lines will be dielectrically isolated from ferrous pipe. Dielectric isolation shall conform with NACE RP-0286.

7.8.5. For ductile iron piping systems (except for ductile iron piping under floor in soil) conduct an analysis to determine if CP and/or bonded or unbonded coatings are required. Unbonded coatings are defined in ANSI/AWWA C105/A21.5.

7.8.6. The Contractor shall conduct and provide an economic analysis to determine if CP and protective coatings should be provided for gravity sewer lines and the following structures in soil resistivity conditions above 10,000 ohm-cm:

7.8.6.1. Potable water lines

7.8.6.2. Concentric neutral cable

7.8.6.3. Other buried/submerged ferrous metallic structures not covered above.

7.8.6.4. Ferrous metallic piping passing through concrete shall not be in contact with the concrete.

8. FIRE PROTECTION.

8.1 General:

8.1.1 Fire protection scope: The fire protection requirements for the project as indicated in this section are generally contained within this section unless otherwise noted. Other fire protection scope indicated by other sections are required and are subject to requirements within this section. All definitions and acronyms used in this section are intended to be used for this section only. All installed materials and equipment are in general to be listed by an independent laboratory such as Underwriters Laboratory or Factory Mutual.

8.1.2 References: The following reference list is not complete. Other applicable references are to be used when required by other sections and the following references.

8.1.2.1. Mil Handbook 1008C (1008C), Fire Protection for Facilities Engineering, Design, and Construction, 10 June 1997

8.1.2.2. Uniform Building Code (UBC) 1997 edition

8.1.2.3. NFPA 101 (LSC), Safety to Life from Fire in Buildings and Structures, 2000 edition.

8.1.2.4. NFPA 13 (FSC), Installation of Sprinkler Systems, 1999 edition.

8.1.2.5. NFPA 13R, (FSCR), Sprinkler Systems in Residential Occupancies up to and Including Four Stories in Height, 1999 edition

8.1.2.6 NFPA 72 (FAC), National Fire Alarm Code, 1999 edition.

8.1.2.7 NFPA 30, Flammable and Combustible Liquids Code, 2000 edition.

8.1.2.8 NFPA 24, Private Fire Service Mains, 1995 edition

8.1.2.9 NFPA 10, Portable Fire Extinguishers, 1998 edition

8.1.2.10 NFPA 96, Ventilation Contreol and Fire Protection of Commercial Cooking Operations, 1998 edition

8.1.2.11 ER 1110-345-700 (ER700), Engineering and Design Design Analysis, Drawings and Specifications, 30 May 1997

8.1.2.12 ADA Accessibility Guidelines (ADAAG)

8.1.2.13 Mil Handbook 1022A (1022), Petroleum Fuel Facilities, 30 June 1997

8.1.2.14 ASME A17.1 (ELEV), 2000

8.1.2.15 UL Fire Protection Equipment Directory (ULFPED), 2000 edition

8.1.2.16 UL Building Materials Directory (ULBMD), 2000 edition

8.1.2.17 UL Fire Resistance Directory (ULFRD), 2000 edition

8.1.2.18 Unified Facilities Guide Specification (UFGS)

8.1.2.18.1 Section 13920A, Fire Pumps, November 1999.

8.1.2.18.2 Section 13930A, Wet Pipe Sprinkler System, Fire Protection, November 1999.

8.1.2.18.3. Section 13935A, Dry Pipe Sprinkler System, Fire Protection, April 2000.

8.1.2.18.4 Section 13851A, Fire Detection and Alarm System Addressable, August 1998.

8.1.2.18.5 Section 13965A, Wet Chemical Fire Extinguishing System, March 1998.

8.1.2.18.6 Section 14210A, Electric Elevators, October 1993.

8.1.2.18.7 Section 14240A, Hydraulic Elevators, October 1993.

8.1.2.18.8 Section 7840a, Firestopping, August 2000.

8.1.2.19 TI 800-01, Technical Instructions Design Criteria, 20 Jul 98

8.1.2.20 Underwriters Laboratories (UL)

8.1.2.21 Engineering Technical Letter (ETL)

8.1.2.22 Factory Mutual (FM)

8.1.2.23 NFPA 80, Standard for Fire Doors and Fire Windows, 1999 edition.

8.1.2.24 NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilating Systems, 1999 edition.

8.1.2.25 NFPA 291, Recommended Practice for Fire Flow Testing and Marking of Hydrants, 1995 edition.

8.1.2.26 NFPA 17A, Standard for Wet Chemical Extinguishing System, 1998 edition.

8.2. **Appendix and Recommendations:** Fire protection criteria in general that are stated in any reference, which are either in the appendix, is stated as a recommendation or addressed with a “should” shall be considered to be mandatory requirements and will be incorporated into the design.

8.3. **Definitions:**

8.3.1 General: Definitions as indicated in LSC shall be used unless otherwise noted.

8.3.2 Fire Protection Work: All construction materials and installation necessary to install complete fire alarm systems, automatic fire sprinkler systems, fire rated partitions, fire rated doors & hardware, fire rated windows & hardware, standpipe systems, firestopping, fire rated construction, emergency lighting, exit signs, automatic fan shutdown, all means of egress and any other work as designated by the DAHJ.

8.3.3 Suite: Multiple room dwelling unit composed of a sleeping room and intermediate room. Suite is considered to be Apartment Occupancy if the intermediate room is either a living room or study room. Any suite, which has intermediate room used for other purposes is considered to be a Dormitory Occupancy.

8.3.4 Intermediate room: A room located between the sleeping room and the exit access corridor, which a sleeping occupant must travel through to reach the exit access corridor.

8.3.5 Dwelling unit: Either a suite or a room in which an occupant has the sole control of egress entry. The occupant/s sleep and live in the dwelling unit.

8.4 **Authority Having Jursidiction (AHJ):** The AHJ is HQUSACE, CEMP-ET, Mr Robert Diangelo. The Designated Authority Having Jurisdiction (DAHJ) is the Honolulu Engineer District Fire Protection Engineer (DFPE), CEPOH-EC-D and will be consulted for all interpretations of fire protection criteria to be used in this project through the Contracting Officer or his representative. Contact with the the AHJ shall only be made through and by the DAHJ, if the DAHJ feels it is necessary . All requests made by the Contractor for interpretations shall be submitted to the DAHJ in writing with the appropriate sketches, basis for waiver, substitution proposal, specific question and any other information deemed necessary by the DAHJ for specific interpretation.

8.5. **Waiver to criteria:** All waivers to be processed in accordance with 1008C, 1.3.6 except shall be forwarded to the DAHJ for preliminary assessment. Waivers to be forwarded to AHJ for approval if deemed necessary by DAHJ.

8.6. **Priority of conflicting requirements.** In general, Contractor to use 1008C & UFGS as the main document for fire protection critieria and shall take precedence over any other document in accordance with 1008C, 1.3.4. ETL's and specific code requirement will supercede general requirements found in 1008C, otherwise the most restrictive requirement shall be provided. DAHJ shall be consulted on all conflicting requirements and reserves the right to make final determination through coordination with the AHJ if deemed necessary. Fire protection requirements in Fire Protection Section 01010 para 8 shall take precedence over any other fire protection requirements in another section of this RFP document. Conflicting requirements of Life Safety and historical preservation shall be brought to the attention of the Contracting Officer in writing and resolved by the DAHJ and historical preservation officer.

8.7. **Fire Protection Engineer Services.** Contractor shall hire a qualified Fire Protection Engineer licensed as a Professional Engineer to consult, design, inspect and prepare design drawings, specifications, calculations and supervise construction as necessary. Qualifications must be submitted in writing to the Contracting Officer for approval. Any other licensed professional engineer or architect, who is a current full Member status of the Society of Fire Protection Engineers is acceptable.

8.8. **Design documents** All Fire Protection Design documents shall be in accordance with ER700 and are required to be submitted for approval prior to start of construction. Minimum submittals as indicated in Design After Award and Required Technical Data for Proposal submissions are required. Fire protection symbols in NFPA 170 shall be used.

8.8.1 Specifications.

8.8.1.1 General requirements: The fire protection work for the project shall be constructed using US Army Corps of Engineers Guide Specifications (UFGS) Sections 13920A, Fire Pumps, 13930A Wet Pipe Sprinkler System, Fire Protection, 13935A Dry Pipe Sprinkler System, Fire Protection, 13851A Fire Detection and Alarm System Addressable, 13965A Wet Chemical Fire Extinguishing System, 14210A Electric Elevators, 14240A Hydraulic Elevators, 7840A Firestopping shall be used and revised in accordance with the restrictions in ER700, Appendix D and the following:

8.8.1.2 Sprinkler systems: No plastic piping or fittings, "T drill method" are allowed. Sprinkler system design area and density shown in 1008C shall be followed.

8.8.1.3 Fire alarm systems: Class A looped fire alarm systems are required. "T taps" are prohibited.

8.9 **UBC requirements**

8.9.1 Allowable area and allowable height: Design analysis shall confirm the allowable construction type and allowable area/height in accordance with UBC by calculating the allowable areas and submitting them in the design analysis. Combustible construction, Type III, IV & V will not be allowed.

8.9.2 Location on property: Design analysis shall show the exterior wall/opening protection required in accordance with UBC.

8.9.3 Occupancy Separation walls: UBC occupancy separation walls are required to be installed throughout the building in addition to the Protection from Hazards separation walls required in LSC.

8.10 **General Life Safety Requirements**

8.10.1 LSC with 1008C amending portions of LSC is to be followed.

8.10.2 All stairs shall be protected in accordance with LSC 7.2.2.5 & 7.2.2.6. All openings not adjacent to stair and within 10 feet of the existing exterior stair shall be protected with 1 hr fire rated wall and ¾ hr fire rated assemblies, LSC 7.2.2.5.2.

8.10.3 Use of magnetic card type locks shall meet LSC for egress.

8.10.4 Firefighter access shall be provided to the roof in accordance with 1008C.

8.10.5 Use of fire rated shafts shall be minimized on all buildings. All pipe risers shall be separated from the duct risers and be firestopped at the floors. All duct risers, which penetrate more than 1 floor shall be enclosed in a 1 hr fire rated shaft and all duct penetrations shall be protected with 1.5 hr listed fire damper. Use of subducts in lieu of fire dampers shall be minimized. Fire dampers shall be listed with ULBMD.

8.10.6 Only Class A interior finishes are allowed in exit stairs and exit passageways regardless of sprinkler protection. Smoke Development ratings are restricted to those indicated in 1008C, 2.7.1.

8.10.7 Exit signs: Internally illuminated signs using Light emitting diode (LED) type shall be used.

8.10.8 Portable fire extinguishers: Provide portable fire extinguisher throughout the building in accordance with NFPA 10 and shall be listed with ULFPE.

8.10.9 Fire rated assemblies: Fire rated doors/door frames and windows (glazing and window frame) shall be listed by ULBMD and shall be installed in accordance with the door/window manufacturer and NFPA 80.

8.10.10 Fire rated construction: All fire rated walls, floors, ceilings, floor/ceilings, roof/ceilings shall meet ULFRD.

8.10.11. Firestopping: All penetrations of fire rated walls by ducts, pipe or conduit must be protected with listed firestopping and installed in accordance with the manufacturer's listed installation instructions. Listed installation instructions shall be submitted for approval to the Contracting Officer prior to installation. Firestopping shall be listed with ULFRD.

8.11 **General Fire Sprinkler requirements.**

8.11.1 All buildings shall be provided with new wet pipe sprinkler system meeting FSC, FSCR, 1008C & UFGS 13930A. Sprinkler flow switches to be connected to the building fire alarm panel.

8.11.2 Area/density method of FSC is to be used except minimum sprinkler design area and densities in 1008C shall be used. Hydrant flows shall be added to all hydraulic sprinkler calculations as indicated in 1008C. Available water supply must provide the fire demand equivalent to the sum of sprinkler demand + hydrant demand + domestic demand. Hydrant flow test shall be performed by Contractor to obtain available water supply capacity. Hydraulic calculations are to be performed using approved computer software. Minimum design hydrant pressure shall be 10 psig at full fire demand.

8.11.3 In the event the available water supply is inadequate, Contractor will be allowed to design the sprinkler system using the reduced design area in FSC without reducing the density. Contractor to show hydraulic calculations using 1008C area/density and show calculations for reduced area/density. Listed engine driven fire pumps shall be provided in a weather protected enclosure or building in accordance with 1008C if available water pressure is still inadequate for reduced design area. Water storage tanks shall be provided in the event the available water supply flow capacity is exceeded. Water tank capacity shall meet 1008C.

8.11.4 Quick response sprinkler shall be used as a minimum throughout the buildings except residential heads shall be used in the dormitory sleeping rooms and other rooms in accordance with FSCR. Decrease in design area allowed by FSC for use with quick response sprinkler heads will be allowed.

8.11.5 Fire department connections must be within 150 feet of hydrant.

8.11.6 Double check type backflow preventers are required on all sprinkler system connections to the potable water supply, which are listed for fire service by an independent testing agency such as UL.

8.11.7 All valves controlling sprinkler water flow farther than 10 feet from building shall be chain and locked open and all the valves 10 feet or closer to the building shall be supervised with a weather resistant tamper switch connected to the fire alarm panel supervisory alarm circuit.

8.11.8 Seismic earthquake requirements in FSC are required.

8.11.9 PVC piping/fittings or “T drill” method is not allowed.

8.11.10 Post indicator valve is required on all sprinkler system supplies, NFPA 24. Elimination of the PIV will be allowed if the backflow preventer/shutoff valve assembly is located in the same location as the PIV, according to NFPA 24.

8.11.11 Hydrant flow test data: Contractor to perform hydrant flow test in accordance with NFPA 291. Flow data to be used for 50% Design submittal.

8.12 **General Fire alarm requirements.**

8.12.1 All buildings to have fire alarm system including fire alarm panel and fire alarm transmitter to report all emergency alarms, supervisory alarms and trouble alarms to the Federal Fire Department, Pearl Harbor meeting FAC, ADAAG, 1008C & UFGS 13851A. All fire alarm systems shall be Class A, looped, addressable systems. Each building to have a fire alarm panel and annunciator located inside the building on the 1st floor in an approved location

8.12.2 Voltage drop calculations are required to be submitted for approval.

8.12.1 T tapping of all fire alarm circuits is not allowed.

8.12.2 All buildings to have visible and audible occupant notification appliances in accordance with ADAAG and FAC. Temporal audible pattern shall be provided as indicated in FAC.

8.12.3 Fire alarm sequence of operations shown in the enclosed Fire Alarm Control Sequence Matrix (MATRIX) shall be provided.

8.13 **Miscellaneous**

8.13.1 Elevator Fire protection requirements shown in UFGS 14210A or 14240A and ELEV are required. Special power shutdown control sequence indicated in the CEGS & MATRIX shall be provided in lieu of ELEV. Control sequences in ELEV not indicated or revised in UFGS 14210A or 14240A shall

be provided. Sprinkler protection is required in hydraulic elevator pits and elevator machine room. Elevator power shutdown is not required from hydraulic elevator pit sprinkler head flow.

8.13.2 Fuel tanks installed for service water heating shall be installed in accordance with 1022 and NFPA 30, local and Federal requirements.

8.13.2.1 Aboveground Concrete lined steel storage tanks are preferred by the Director of Public Works. Provide all appurtenances in 1022, Table 2 and NFPA 30, 2.3.2.3.3. Tank capacity cannot exceed 12,000 gallons. Aboveground tank shall be located minimum 50 feet from above ground power lines. Distance from building and property lines shall be ½ of that indicated in 1022, 8.3.5.2. General requirements of 1022, 8.5 shall be provided.

8.13.2.2 Below ground tanks shall be secondary containment type with leak detection, overfill protection and cathodic protectetion. Provide all appurtenances in accordance with 1022, Table 2 and NFPA 30.

8.13.3 All air handling systems shall be provided with automatic shutdown in accordance with NFPA 90A. Air handling systems shall meet NFPA 90A and LSC.

8.13.4 Kitchen exhaust hoods and exhaust duct provided for all grease producing kitchen equipment shall be provided with fire suppression systems in accordance with NFPA 96, NFPA 17A and UFGS 13965A.

9. LANDSCAPE DESIGN.

9.1 Objectives: The landscape of Quad F shall provide an aesthetically pleasing setting and a quality environment that creates a sense of place and pride for the Soldiers who will work and live in the barracks complex. The streetscape plantings of Foote Avenue and the Quad F parking lot south shall integrate the various functional areas to unify the historic district of Schofield Barracks. The landscape plan shall enhance the installation's image by implementing the recommendations of the Exterior Architectural Plan and the Cultural Resources Management Plan. The plan shall conform to antiterrorist/force protection guidelines and apply the principles of sustainable design and traffic calming. The design shall promote simplicity, apply best management practices, and select appropriate materials to achieve visual quality at low to moderate maintenance costs.

9.2 References. The following references are available for review at the Agronomy Office, Directorate of Public Works located at Building 113, Wheeler Army Airfield, Oahu, Hawaii:

9.2.1 Schofield Barracks: Installation Exterior Architectural Plan (IEAP), U.S. Army Corps of Engineers, October 1986.

9.2.2 Schofield Barracks: Cultural Resource Management Plan, U.S. Army Corps of Engineers, April 2000.

9.2.3 Streets and Sidewalks, People and Cars, The Citizens' Guide to Traffic Calming, Dan Burden, April 2000.

9.2.4 Sustainable Training Regimen for Planners, Architects, and Engineers, Department of Defense, 2000.

9.2.5 How to Save Trees During Construction, Tree City USA Bulletin No. 7, National Arbor Day Foundation.

9.2.6 Trees and Development: A Technical Guide to Preservation of Trees During Land Development, Nelda Matheny and James Clark, 1998.

9.2.7 City and County Ordinance No. 00-54, Exceptional Trees, City and County of Honolulu.

9.3 Design Considerations

9.3.1 Antiterrorism/Force Protection (AT/FP). The AT/FP guidance discourages landscape plantings that exceed 6 inches in height within 30 feet of a barracks building. This requirement shall result in the removal of the existing shrubs, hedgerows, groundcover, and the majority of trees growing close to the structures of the quad. New landscape plantings around the buildings shall be limited to turf and very low growing groundcover. Tree plantings are allowable within the 30 feet standoff distance as long as the trees have single trunks and have upright (columnar or round-shaped) canopies. Canopies of mature trees shall not have low hanging branches and shall clear the building by 15 feet.

9.3.2 Historic Preservation Landscape Program. The large, mature trees such as monkey pods, banyans, ear pods, eucalyptus, and tall Norfolk Island pines and royal palms are characteristic of the landscape of the quads and the preservation of these heritage trees is important in maintaining the ambience of the historic district. In addition, tree gaps created by earlier tree removals shall be filled in with new plantings of the same tree species to re-establish the rhythmic pattern of the streetscape. Another important feature of the historic district is the open spaces such as the green belt along Glennan Avenue and the central court of the quad that were key elements of the original installation layout.

9.3.3 Exceptional Trees. Six trees (tree nos. 2216, 2217, 2226, 2238, 2290, and 2291 in the Tree Preservation Plan) in the project site are registered as Exceptional Trees of the City and County of

Honolulu and are protected by city ordinance. A banyan tree (no. 2169) has been nominated for exceptional status and therefore will be treated as one in this project. The design team shall consult with the Mayor's Arborist Advisory Committee to ensure the status, dignity, and health of the trees are preserved and appropriate measures are taken to protect the trees. The construction contractor shall obtain a permit from the City and County of Honolulu Department of Parks and Recreation to perform work near the exceptional trees.

9.3.4 Foote Avenue Corridor (Glennan Avenue to Meigs Avenue). The establishment of street trees along the length of Foote Avenue shall define this major thoroughfare and create a strong visual edge of the historic district. The Foote streetscape shall mirror the existing shade tree plantings of Waianae Avenue that borders the quads on the north. The tree plantings shall also reduce the scale of the quad building facade, calm traffic, and provide shade to the area. Hedge plantings shall screen the parking lots to visually unify the area and reinforce the integrity of the historic district. Wide walkways on both sides of this main corridor shall promote pedestrian and bicycle traffic.

9.3.5 Screens and Buffers. The use of trees, hedgerows and other landscape screening methods shall conceal unsightly areas or structures to enhance visual image.

9.3.6 Plant Selection. The landscape plants shall reinforce a tropical theme with emphasis on the use of palm trees. When possible, material selection shall reflect the orange and yellow colors of the 25th Infantry Division's insignia. Plant species shall be easy to maintain, locally hardy, and tolerant to the specific site conditions. The use of suitable native species is encouraged. Poisonous plants and trees that bear edible fruit, are very littersome, or have aggressive root systems shall not be utilized.

9.3.7 Sustainable Sites Design. The project shall minimize site disturbance to prevent soil erosion and to protect the existing trees and their roots. The design shall minimize off-site storm water runoff by promoting the use of pervious surfaces. The landscape design shall integrate water conservation measures by installing hardy native plants, drip irrigation systems, and mulches. The design shall apply alternative treatments to minimize lawn areas and landscape for energy conservation by planting appropriate shade trees in locations to cool adjacent streets, parking lots, walkways, and buildings.

9.3.8 Minimize Tree Conflicts. The design shall select tree species with non-aggressive root systems to minimize tree root conflicts with foundations, sidewalks, and underground utilities. Tree selection shall also fit (size and shape) the species to match the available growing space above and below ground. The design shall locate new tree plantings to avoid potential conflicts. In new planting locations and existing tree sites where root conflicts are inevitable, install treatments that will mitigate the situation.

9.4 Landscape Minimum Requirements

9.4.1 Tree Preservation and Removal

9.4.1.1 The preliminary inventory of existing trees for the project area is shown in the attached RFP reference drawing entitled TREE PRESERVATION AND REMOVAL PLAN. (Note that additional existing tree inventory information will be shown on the topographic survey and will be provided to the Offeror during the advertising period.) This plan classifies each individual tree into one of four classes as indicated below:

9.4.1.2 Class AA category. Designated trees shall be saved in place. These trees are registered as "Exceptional" and are protected by City and County Ordinance. Special tree protection requirements during demolition and construction will apply.

9.4.1.3 Class A category. Designated trees shall be saved in place. One exception is the banyan tree (no. 2806). Although it is a desirable tree, the Government will consider demolition if its removal enhances the efficiency of the new parking lot.

9.4.1.4 Class B category. Designated trees shall be relocated within the project site. New location of the trees shall be indicated in the landscape planting plan.

9.4.1.5 Class C category trees shall be removed during the demolition phase of construction.

9.4.1.6 Tree Protection Zone. No grading, compaction, or construction activity shall occur in this zone immediately surrounding a Class AA or A tree. All underground utilities, storm drains and irrigation lines should be routed outside the tree protection zone. If utilities must traverse the tree protection zone, they shall be tunneled or bored at a depth of 4 feet or greater within the zone. For parkia, banyan, and mahogany trees, the zone shall extend radially outward to 20 feet from the external surface of the trunk. For all other broadleaf type of tree species, the zone shall extend to 15 feet. For all palm trees, the zone shall extend to 10 feet. The zone shall be entirely enclosed by a temporary fence prior to any demolition work and shall remain in place until all site work and building construction are completed. The location of all Class A and Class AA trees shall be identified in the offeror's Demolition Plan, Landscape Plan, Grading, and Utility Plans.

9.4.1.7 Tree Protection During Demolition and Construction

9.4.1.7.1 The Contractor shall retain the services of an arborist who has been certified for at least 5 years with experience in tree protection during construction, tree pruning and transplanting trees. The Contracting Officer shall approve the selection of the certified arborist. The arborist shall provide consulting services and perform quality assurance duties during the contract period. The arborist shall serve as the Contractor's liaison with the Mayor's Arborist Advisory Committee on matters pertaining to the protection of the exceptional trees on the project site. The arborist shall also ensure that branch and root pruning and tree relocation work are performed in accordance with standards of the National Arborists Association and the International Society of Arboriculture; proper measures are taken to protect the canopies and root systems of the trees from unnecessary damage from construction activity; when potentially damaging construction activity is performed, that such activity is performed in a manner that will minimize damage to the tree; and trees are provided proper care and remain in good health during the demolition and construction period.

9.4.1.7.1.2 The Contractor shall arrange a pre-construction meeting attended by the Contractor, sub-contractors, Contracting Officer and selected consultants, and the Contractor’s certified arborist to review procedures for performing tree-related work, work in the areas of saved trees, access routes, storage areas, and measures to protect trees during construction.

9.4.1.7.1.3 Protection Fence. The Contractor shall erect a temporary fence around each saved tree such that the fence encloses the tree protection zone as a minimum (Diagram 1). Exceptional trees will require additional protection as prescribed by the Mayor's Arborist Advisory Committee. The fences shall be erected prior to the commencement of any work and shall not be removed until all work that is potentially injurious to the trees is completed. If an existing structure prevents proper enclosure of the tree protection zone prior to demolition, the Contractor shall initially erect the fence around the tree to the extent that is reasonably possible. After demolition, the fence shall be reconfigured to enclose the tree protection zone. Protection fences shall not be relocated or removed without the written permission of the arborist.

9.4.1.7.1.4. Limitation of Construction Activities under Existing Tree Canopies. The Contractor shall limit activities under the canopy of existing trees to only those activities explicitly required to complete the construction under and/or adjacent to the tree’s canopy as shown and specified. All excavation work required under the canopy of the tree shall be performed under the direction of the arborist. Material and topsoil stock piling, vehicle parking, temporary roadways, construction material mixing, portable latrine, and field office will not be allowed under the canopy. Spoils, waste, and washout water shall not be deposited or stored, either temporarily or permanently, under the canopy.

9.4.1.7.1.5. Tree Pruning. A certified tree worker under the general supervision of a certified arborist shall perform the tree pruning and root pruning work.

9.4.1.7.1.6. If injury should occur to any tree during construction, the Contractor shall immediately report the injury to the certified arborist. The certified arborist shall evaluate the injury and apply appropriate treatments. The Contractor shall submit a written report of the tree injury and treatment to the Contracting Officer.

9.4.1.7.1.7. Tree Maintenance. The Contractor shall irrigate the trees as necessary to maintain their health during the course of the demolition and construction period. Groundcover growth within the fenced-in area shall be maintained at a height not to exceed 250 mm (10 in). The application of herbicides is prohibited under the canopy of the trees.

9.4.1.7.1.8. Root Pruning. Before grading, pad preparation, or excavation for foundations, footings, walls, or trenching, prune roots that are greater than two (2) inches in diameter by manually digging a trench and cutting exposed roots with a saw, vibrating knife, rock saw, narrow trencher with sharp blade, or other approved root pruning equipment. Any roots damaged during grading or construction shall be exposed to sound tissue and cut cleanly with a saw.

9.4.1.7.1.9. If temporary haul or access roads must pass over the root area of trees, a roadbed of 6 inches of mulch or gravel shall be created to protect the soil. The roadbed material shall be replenished as necessary to maintain a 6-inch depth.

9.4.2. New Tree Plantings for Restoration. Provide trees to fill in gaps at the following locations: royal palms (*Roystonea Regia*) in the back of building 651 and in the quad central court; mahogany trees (*Swietenia macrophylla*) along Lewis Street; Mexican Fan Palm (*Washingtonia robusta*) along west boundary (Glennan Avenue) of the Quad F parking lot south; and a large canopied shade tree for the green space area west of building 649.

9.4.3. Landscape Building 649 Front Entrance on Waianae Avenue. Provide landscaping to enhance and accentuate the entryway of the building.

9.4.4. Quadrangle F Signage. Provide lighted signage to identify "Quadrangle F". Also, indicate its year of construction "Est. 1931". The sign architecture shall be compatible with the character of building 652. Minimum sign size 2.5 feet x 4 feet excluding base. Lettering shall be pin mounted. Place sign in an appropriate location along Waianae Avenue. Provide landscaping to accentuate signage.

9.4.5. Landscape Front Entryway Courtyards of Buildings 650, 651, and 652. Design an entrance space to the buildings that will accommodate and direct pedestrian traffic and create an atmosphere for socializing. Place more emphasis on the development of the center entryway and less on the side courtyards. As a minimum requirement, plant groupings of coconut palm trees at staggered heights ranging from 20-30 feet in height in the courtyards. Create visual interest by varying the selection of materials for the walkway, groundcover, mulch, and edging material. The same design shall be applied to all three buildings.

9.4.6. Foote Avenue Corridor Streetscape

9.4.6.1 Close the entry to the road west of building 472 by constructing curbing along Foote Avenue and constructing a 20-feet wide street lawn.

9.4.6.2 Close entry to parking north of building 360 by constructing curbing along Foote and constructing a street lawn approximately 30-feet in width to match existing lawn of building.

9.4.6.3 Within the project limits, construct an 8-feet wide sidewalk on the north side of the street and a 5-feet wide sidewalk on the south side. Sidewalks shall be adjacent to the curbing.

9.4.6.4 On the south side of the street, construct 4-5 feet wide planter strips with curbing along the parking lot edge fronting the street. Planter strips are not required along the street fronts of buildings 360, 472, 500, and 648. Provide breaks in curbing on the parking lot side to allow for sheet flow drainage where appropriate. Width of planter strips will vary depending on available space between the sidewalk and parking lot. Parking stalls shall have minimum length of at least 15 feet. Plant hedgerow screening in the planter strip allowing space for 2 feet of car overhang.

9.4.6.5 Provide a minimum of 20 rainbow shower shade trees along the south side of Foote Avenue. Where wells are installed in parking areas, construct the wells approximately 11 feet x 15 feet in dimension and locate each well so that only 2 parking stalls are affected per well. Wells in parking lots shall be curbed and connected to the shrub bed curbing. Spacing between plantings will vary according to site conditions and tree species selected. In the parking lot across the street of building 550, use the location of the existing tree wells. Where appropriate, provide pedestrian access between the parking lot and street by constructing 2-feet wide passageways at the tree well sites. The recommended locations of 20 tree wells are shown in Sheets C-1 thru C-3. The locations selected minimize the impact on parking stalls.

9.4.6.6 The new tree plantings shall require the removal of 3 Jacaranda trees located in the parking lot across the street of building 550. These trees are not shown in the Tree Preservation Plan.

9.4.7 Landscape Quad F Parking Lot South

9.4.7.1 Landscape requirements for the north boundary along Foote Avenue is described in paragraph 9.4.6.

9.4.7.2 On the west boundary along Glennan Avenue construct a 4-feet wide planter strip along the edge of the parking area. Plant hedgerow screening in the planter strip.

9.4.7.3 On the south boundary, construct a 10-feet wide median strip with curbing that will provide a safe path for pedestrians in the east-west direction. Provide 2 entryways into the parking lot. Allow 2 feet of overhang for parked cars. Walkway width shall be a minimum of 4 feet. Plant a minimum of 15 Hawaiian Kou shade trees. Design median strip with a minimum of 25% pervious surface area to intercept storm water sheet flow from the commissary parking lot. Groundcover over pervious area shall be inorganic mulch. Ensure design provides positive drainage through the median strip and minimizes channeling of runoff.

9.4.7.4 On the east boundary, construct curbed traffic islands. Plant a minimum of 1 Hawaiian Kou shade tree on each island.

9.4.8 Landscape Hall Memorial. The memorial plaque is located in the quad court, on center of the north perimeter fronting building 649. Provide paved sidewalk with a minimum width of 5 feet from the curbing to the plaque. Provide plantings to define and accentuate the memorial.

9.4.9 Screen Plantings. Provide plantings to screen unwanted views of trash enclosures, utility pad mounts, etc. that are outside of the AT/FP standoff zone of 30 feet from buildings.

9.4.10 Turf Plantings

9.4.10.1 St. Augustine (*Stenotaphrum secundatum*): Establish grass around building 649, in center and side courtyards of buildings 650, 651, and 652 and in all other areas where sunlight conditions do not favor common bermuda grass.

9.4.10.2 Common Bermuda (*Cynodon dactylon*): Establish grass in the central court of the quad complex and in all other turf areas within the project site not planted with St. Augustine. Disturbed ground areas outside of the project area shall also be re-established with bermuda grass.

9.4.11 Tree Planting Material Requirements

9.4.11.1 Royal palm (*Roystonea Regia)*: field stock, trunk height range 15-20 feet; trunk unmarked with a diameter measurement not less than 12 inches along any point of the trunk; no excessive tapering of trunk at the crown.

9.4.11.2 Mexican Fan Palm (*Washingtonia robusta*): field stock, trunk height 10-15 feet, trunk unmarked with a diameter measurement not less than 10 inches along any point of the trunk.

9.4.11.3 Mahogany trees (*Swietenia macrophylla)*: size 15 gallon, caliper not less than 1 inch.

9.4.11.4 Rainbow Shower var. Nii Gold and Wilhimena Tenney (*Cassia javanica x cassia fistula*): field stock, diameter at breast height not less than 4 inches, first crotch above 5 feet, height not less than 10 feet.

9.4.11.5 Hawaiian Kou *(Cordia subcordata*): pot size 15 gallons, caliper not less than 1 inch, height not less than 5 feet.

9.4.11.6 Coconut palm *(Cocos nuciferas)*: field stock, trunk height range 20-30 feet; trunk unmarked with a diameter measurement not less than 12 inches along any point of the trunk.

9.4.11.7 Large canopied shade tree (species not identified): pot size 25 gallon, trunk caliper not less than 2 inches, height not less than 8 feet.

9.4.12 Quality of Planting Material. All plant material furnished shall have a habit of growth that is normal for the species and shall be healthy and free from disease, insects and injuries. Trees and shrubs shall have well developed branching with vigorous root systems. Roots must fill containers, but show no evidence of being or having been root bound. Trunks shall be reasonably straight and symmetrical with crown and have a persistent main leader. Trees shall not be "poled" or the leader removed. Any tree or shrub with a weak, thin trunk not capable of supporting itself when planted in the open will be rejected. Plants shall equal or exceed measurements specified in the planting plan, which will be the minimum acceptable sizes after pruning. If any plant specified is not obtainable, submit a written substitution presenting either a different size of the same species or a similar alternate species. Substitutions of plant materials will not be permitted unless authorized.

9.4.13 Imported Screened Topsoil. New topsoil at a minimum of 6 inches deep shall be furnished for the newly planted areas in the front and side courtyards of buildings 650, 651, and 652. The topsoil shall be fertile, friable of loamy character, and amended with humus material. The soil shall have passed through a 6.4 mm screen. The topsoil shall be free of weed seeds, other viable plant material such as nutgrass, stones, and other deleterious substances.

9.4.14 On-Site Topsoil. Except for the areas identified in paragraph above, all areas shall use the saved topsoil from the site. Soil tests shall be performed for pH, chemical analysis and mechanical analysis to establish the quantities and type of soil amendments required for the type and variety of plant material specified. The saved topsoil shall be amended per recommendations of the soil test. If the stored site's topsoil is not sufficient to cover the landscaping needs, additional topsoil shall be provided by the contractor from an approved off site source.

9.4.15 Root Barriers. Root barriers shall be provided for new plantings of the broadleaf trees in the parking lots and streetscapes. In addition, provide root barriers for saved broadleaf trees located close to pavements and foundations. Barriers shall be woven fabric, minimum 19.5 inches in width, with integral chemical nodules. Linear type of application method of the root barrier shall be used rather than encircling the tree root ball.

9.4.16 Landscape Edging. Bed dividers shall be provided to separate shrub beds, tree wells, and mulch treatments. Plastic header shall be flexible, resin-formulated edging 5.25 inches high and have a 1.12

inch diameter bead; designed with ribbed sides and a t-shaped bottom; heavy duty grade construction; and sun guarded, carbon black for uv protection.

9.4.17 Mulch Applications. Organic and/or inorganic mulch treatments shall be provided in shrub beds, planter wells, and in appropriate areas where it can serve as a cost-effective alternative to turf groundcover. As a minimum, organic mulch material shall be stable, fully composted green waste; gray to dark brown; no odor; ph 7-8; 80% of the material shall pass through a screen of 3 inches or smaller; and free of viable weed seeds, litter, and deleterious material.

9.4.18 Percolation Test. Test for percolation shall be performed to determine positive drainage of plant pits and beds. All soil and drainage conditions detrimental to the growth of plant material shall be identified and a proposal correcting the conditions shall be submitted.

9.4.19 Installation of Plant Material. For tree pits in parking lots, minimum size of planting hole shall be 5 feet by 5 feet by 3 feet deep. Remove existing pavement, base course, and sub-base course and backfill with topsoil and compact to 70% of maximum density. When obstructions below ground or poor drainage affect the planting operation, proposed adjustments to plant location, type of plant and planting method or drainage correction shall be submitted. For all other plant pits, excavate and backfill as recommended by the trade and ANSI Z60.1

9.4.20 Maintenance During Planting Operation. Installed plants shall be maintained in a healthy growing condition. Maintenance operations shall begin immediately after each plant is installed and shall continue until the plant establishment period commences.

9.4.21 Maintenance During Establishment Period.

9.4.21.1 The maintenance period shall begin upon written acceptance of the planting operations and continue for 365 days thereafter. During this period, provide plants with optimum growing conditions and maintain the appearance of the planted areas.

9.4.21.2 The maintenance of plants shall include, but not limited to, straightening plants, tightening stakes and guying material, repairing tree wrap, protecting plant areas from erosion, maintaining erosion material, supplementing mulch, removing dead or excessive growth by pruning, maintaining edging of beds, checking for girdling of plants, watering, fertilizing, weeding, insects and diseases pest control, removing and replacing unhealthy plants and unsatisfactory turf areas, mowing turf, and removing plant and litter debris.

9.4.21.3 Unhealthy Plant. A plant shall be considered unhealthy or dead when the main leader has died back, or 25 percent of the crown is dead. Determine the cause for an unhealthy plant. Unhealthy or dead plants shall be removed immediately and shall be replaced as soon as seasonal conditions permit in accordance with the following warranty paragraph.

9.4.21.4 Restricted use pesticides shall not be utilized. All pesticide applications, regardless of pesticide application, shall be performed or supervised by personnel that are certified by the State of Hawaii to apply pesticides in the Ornamental Plants and Turf category.

9.4.22 Automatic Irrigation System.

9.4.22.1 Provide permanent fully automatic irrigation systems for the landscaped and turf areas surrounding buildings 649, 650, 651, and 652; the central court yard of the quad; and the street lawn of the Quad F parking lot along Foote and Glennan Avenues to include the large banyan trees.

9.4.22.2 A computer based controller(s) shall be provided. For the quad court, install Hunter I-40 rotor Pop-up with check valve and stainless steel riser (or equivalent) irrigation heads with triple-swing joint connection to the lateral.

9.4.22.3 Place main lines a minimum of 18 inches and laterals 12 inches below finished grade. Place pipes and electrical wiring crossing pavement at least 18 inches below finish grade at sidewalks and 2 feet below finish grade at roadways. Install electrical wiring below irrigation pipes for protection. Provide appropriately sized sleeves for all pipes going under sidewalks and roads.

9.4.23 Automatic Drip Irrigation System. Provide permanent fully automatic drip irrigation systems for the Foote Avenue streetscape and Quad F parking lot south. Main and laterals shall be pvc plastic pipe. Timers shall be battery operated.

9.4.24 Disposal of green waste material shall be outside the limits of Government property, and shall be the contractor's responsibility. The contractor may at his option dispose of trees and shrubs by chipping the green waste and applying the material as a mulch layer 100 to 150 mm (4 to 6 in.) thick over bare ground surfaces of training grounds at Schofield Barracks to control soil erosion. The Director of Public Works, Schofield Barracks, will determine the location of the disposal site.

9.4.25 Warranty.

9.4.25.1 Furnished plant material shall be guaranteed to be in a vigorous growing until completion of the maintenance period. Plants that decline or die during the warranty period shall be replaced using the same kind and size as originally planted. The warranty shall also apply to existing trees on the job site that are either saved in place or relocated (transplanted).

9.4.25.2 Furnished irrigation system shall be guaranteed to be in full operation during the maintenance period. Material and equipment found to be defective due to faulty material or workmanship shall be immediately repaired or replaced. The contractor is responsible for damage caused by the irrigation system during the installation or the warranty period due to failure of workmanship or materials.

10. SUSTAINABLE DESIGN CONSIDERATIONS:

10.1. Sustainable design techniques shall be considered for this project. Techniques which conserve energy, improve livability, and can be justified by life cycle cost analysis as cost effective are encouraged. Integration of energy conservation systems with the building's renovation and alteration work (lighting, structure, mechanical systems, and aesthetics) is essential to facilitate livability and maximum energy savings. The following paragraphs define the goals and general objectives for inclusion of sustainable design considerations in this project. The listing is not all inclusive, and the techniques suggested may not e cost effective at a given location or site.

10.2. Goals and Objectives of Sustainable Design.

10.2.1. The overall U.S. Army Corps of Engineers (USACE) goal of Sustainable Design is to be environmentally responsible in the delivery of facilities. The key traditional elements for decision making in the facility delivery process are cost, quality and time. These elements need to be expanded to include the ecological and human health impacts of all decisions.

10.2.2. Each project generates its own set of goals. However, sustainable design goals should apply to all projects. The goals for improving the environmental performance of facilities include: (a) use resources efficiently and minimize raw material resource consumption, including energy, water, land and materials, both during the construction process and throughout the life of the facility, (b) maximize resource reuse, while maintaining financial stewardship, (c) move away from fossil fuels towards renewable energy sources, (d) create a healthy and productive work environment for all who use the facility, (e) build facilities of long-term value, and (f) protect and, where appropriate, restore the natural environment.

10.3. Sustainable Design and Construction of the Built Environment. Design and construction of sustainable buildings should be in accordance with the following concepts:

10.3.1. Site Work and Planning. Site planning evaluates solar and wind orientation, local microclimate, drainage patterns, utilities and existing site features to develop optimal appropriate low maintenance landscape plant material.

10.3.2. Building Layout and Design. This project involves four three-storied buildings. While these buildings can not be re-oriented, careful attention to solar and wind orientation is required to layout rooms for energy performance and comfort. Design components of the building environment for durability and for waste recycling.

10.3.3. Energy. Building orientation and massing, natural ventilation, day-lighting, shading and other passive strategies, can all lower a building's energy demand and increase the quality of the interior environment and the comfort and productivity of occupants. Existing window locations determine the amount of shading that is required.

10.3.4. Building Materials. Environmentally preferable building materials are durable and low maintenance. Within the parameters of performance, cost aesthetics and availability, careful selection and specification can limit impacts on the environment and occupant health.

10.3.5. Indoor Air Quality (IAQ). Indoor air quality is most effectively controlled through close coordination of architecture, interiors and mechanical, plumbing, and electrical design strategies that limit sources of contamination before they enter the building. Construction procedures for IAQ and post-occupancy user guides also contribute to good long term IAQ.

10.3.6. Water Usage--Site design strategies that maximize natural filtration of rainwater are desirable. Water conservation is enhanced by the use of low flow pluming fixtures and water appropriate landscaping.

10.3.7. Recycling and Waste Management--Waste and inefficiency can be limited during construction by sorting and recycling demolition and construction waste, reuse of on-site materials and monitoring of material use and packaging. Accommodating recycling into building design reduces waste while generating revenues.

10.3.8. Building Commissioning, Operations and Management--Effective building commissioning is essential to ensure proper and efficient functioning of systems. Facilities operations benefit from energy and water saving practices, waste reduction and environmentally sensitive maintenance and procurement policies.

10.4. Leadership in Energy and Environmental Design (LEED) Green Building Rating System. The LEED Green Building Rating System is a priority program of the US Green Building Council. It evaluates environmental performance from a whole building perspective over a building's life cycle, providing a definitive standard for what constitutes a green building. LEED's rating system is structured to rate new and existing commercial, institutional, and high-rise residential buildings. It is a feature-oriented system where credits are earned for satisfying each criteria. Different levels of green building certification are awarded based on the total credits earned.

10.4.1. This project will implement the LEED Green Building Rating Systems as modified herein to reflect the Department of the Army's sustainable design goals for their facilities. The modified LEED Green Building Rating Systems is called SPIRIT for Sustainable Project Rating Tool. There are eight (8) criteria categories with a total score of 100.

CRITERIA CATEGORIES		Maximum points
1.	Sustainable Sites	20
2.	Water Efficiency	5
3.	Energy And Atmosphere	28
4.	Materials And Resources	13
5.	Indoor Environmental Quality (IEQ)	17
6.	Facility Delivery Process	7
7.	Current Missions	6
8.	Future Missions	4
	Maximum Facility Points	100

10.4.1.1. Each criteria category is defined by Intent, Requirement and Technologies/Strategies.

Intent	A statement of the primary goal for the criterion.
Requirement	Quantifiable conditions necessary to achieve stated intent.
Technologies/Strategies	Suggested technologies, strategies and referenced guidance on the means to achieve identified requirements.

10.4.1.2. Projects are evaluated for each criterion which are either "*Prerequisites*" or result in a point score. Prerequisites in a given criterion are minimum requirements that must be met. No further points can be awarded until the prerequisite is satisfied.

10.4.2. There are four (4) sustainable project levels: platinum, gold, silver and bronze. This project is required to meet at least a bronze level.

Bronze Facility Level	25 to 34 points
Silver Facility Level	35 to 49 points
Gold Facility Level	50 to 74 points
Platinum Facility Level	75 to 100 points

10.4.3. A sustainable design rating worksheet is found in Section 00900. The worksheet should be used to evaluate this project. An Excel spreadsheet incorporating the sustainable design worksheet is available for your use. The SPIRIT rating sheet will be required after award of the RFP.

SECTION 01011

SPECIFIC FUNCTIONAL DESIGN CRITERIA FOR QUAD F

1. UNACCOMPANIED ENLISTED PERSONNEL HOUSING (Buildings 651 and 652).

1.1. Unaccompanied Enlisted Personnel Housing (UEPH). Buildings 651 and 652 are designated as UEPH facilities. The minimum number of persons to be accommodated in a UEPH building is 150 soldiers. This is defined as the number of soldiers that can be housed within a UEPH building at the E2 through E4 grade level. Soldiers at grade levels E2 through E4 are entitled to a private living/sleeping room and a shared bathroom with one other soldier. Soldiers at grade levels E5 through E9 are entitled to a private sleeping room, a private living room and a private bathroom.

1.1.1. The existing building configuration, partition locations, pipe chases, structural columns, and window locations may limit the possibility of meeting the UEPH space criteria in all cases. However, each project will be based on sound architectural and engineering judgment to ensure the maximum use of existing assets within authorized funds. There are five distinct areas of concern: function (what the building is to do in terms of space requirements and relationships); aesthetics (what the building should look and feel like); technology (how it can be built, control of interior environment and selection of materials); economics (the limitations of the budget); and sustainable design (integrated design emphasizing environmental stewardship).

1.1.2. Prototype UEPH Unit. The purpose of the prototype UEPH unit is to verify the details of the approved design and material selections and to establish the quality level against which the remaining work will be judged. At the site, construction connection details shall be exposed for study by authorized inspectors for a period of time determined by the Contracting Officer. The UEPH unit or prototype at the site is subject to Contracting Officer's approval. At the site, the complete prototype shall be constructed for each unit type. Each stage of work shall be completed and accepted on the prototype prior to starting work on the same stage for similar units in the project.

1.1.3. "Site-Built." A prototype UEPH unit shall be required for each unit type, in accordance with FAR 9.306.

1.2. Design Requirements. Provide a minimum 150 UEPH living/sleeping rooms each for Buildings 651 and 652. An E2-E4 module consists of two sleeping/living rooms, a bathroom, two walk-in closets, and a service area. Design the module to house two enlisted personnel at the E2 through E4 grade level or one enlisted soldier at the E5 through E9 grade level. Provide entry to the module from interior or exterior corridors. The UEPH space criteria and accommodations are shown in Table 1-1. Gross area of a module consisting of 2 living/sleeping rooms with a shared bath and service area shall not exceed 66 square meters (710 square feet).

TABLE 1-1 - UEPH MODULE SPACE CRITERIA AND ACCOMMODATIONS

GRADE	ACCOMMODATIONS AND NET LIVING AREAS	BATHROOM FACILITIES
E1 through E4	• A private sleeping/living room with a net living area of 13-17 m^2 (140-183 ft^2). • A walk-in closet with a net area of 2.8 m^2 (30 ft^2). • A shared service area.	Two-person shared bathroom.
E5 through E9	• A private sleeping room with a net living area of 13-17 m^2 (140-183 ft^2). • A private living room with a net living area of 13-17 m^2 (140-183 ft^2). • Two walk-in closets each with a net area of 2.8 m^2 (30 ft^2). • A service area.	Private bathroom.

In order to better utilize the existing floor space in Buildings 651 and 652, UEPH floor plans can include a combination of UEPH modules and private rooms. Private rooms for E2-E4 soldiers will have the same amenities as a module but will have a private bath and service area. E5-E9 private rooms will also have the same space accommodations of the module but separate sleeping and living rooms is an option.

1.2.1. Sleeping/Living Rooms. Net living/sleeping area is defined as the clear area in the room allocated for an individual's use including bed and desk space, and interior room circulation space. It does not include the bathroom, walk-in closets, and service area. However, under no circumstance will private sleeping/living rooms be less than 85% of the 13 m^2 (140 ft^2) requirement.

1.2.2. Bathroom. Every bathroom shall contain a water closet, a lavatory with vanity cabinet and either a tub with shower assembly or a shower stall.

1.2.2.1. Vanity cabinets shall be provided in all baths.

1.2.2.2. Bathroom accessories may be surface mounted or recessed and made of non-corrosive metal or ceramic. Provide drawings indicating the location and mounting heights of all bathroom accessories. The following accessories will be provided:

Bathroom Accessory	**Quantity**
Toilet paper holder, single arm (no rollers and springs) Toilet paper holder shall be installed with a solid wood backing.	1
Medicine Cabinet with Mirror Door. Minimum mirror size shall be 660 mm (26 inches) high by 406 mm (16 inches) wide.	1
Soap dish in tub and/or shower area, recessed or surface mounted. Soap dish shall be furnished without washcloth holder (i.e. grab bar).	1
Shower curtain rod.	1
Towel rings. Towel rings shall not be over the water closet. Towel rings shall be installed with a solid wood backing.	2
610 mm (24-inch) towel bars. Towel bars shall not be over the water closet. Towel bars shall be installed with a solid wood backing.	2
Bathrobe hook.	2

1.2.2.3. Tubs and showers shall not be placed under windows. Enameled cast iron tub with slip-resistant bottoms (No lead allowed) is highly preferred over enameled formed steel tub. Shower stall floor receptors shall be non-slip solid surface polymer similar or equal to Corian®, ceramic tile or precast terrazzo. Shower pans shall be provided for shower stall floor receptors. Shower pans shall be copper.

1.2.2.4. Baths provided with natural ventilation is preferable. Provide natural ventilation by means of operable exterior openings with an area specified by codes or with mechanical exhaust ventilation. Mechanical exhaust ventilation shall be switch operated and shall be ducted to the exterior of the building.

1.2.3. Service Area. The service area includes a countertop, cabinetry, sink, and space for an under-counter refrigerator and a countertop microwave oven. An outlet shall be provided adjacent to space designed to accommodate a government-furnished microwave oven and for a government-furnished undercounter refrigerator.

1.2.4. Walk-in Closets. Walk-in Closet. A walk-in closet of approximately 2.8 m^2 (30 ft^2) net area will be provided in each sleeping/living room.

1.2.4.1. Closet shelving. Closets shall be equipped with a 305 mm (12 inches) deep shelf and a clothes hanger rod. Closet shelving in excess of 1200 mm (4 ft) shall have center supports or intermediate supports not greater than 914 mm (3 feet).

1.2.4.2. Closet doors. Closet doors should be located to permit placement of furniture in the corners of the rooms by providing an 460-mm (18-inches) return adjacent to a furnishable wall. Closet doors shall be wood and shall be swing type. Clothes hanger rods shall be supported at ends and supported intermediately at maximum 914 mm (3 feet) on center. Shelving shall be plywood with exposed edge to be trimmed with matching strip or a pre-fabricated metal storage shelving system. The pre-fabricated metal storage shelving system shall be corrosion resistant and capable of withstanding heavy use. No particle board shall be used in closets.

1.2.5. Antiterrorism/Force Protection (AT/FP) and Seismic Evaluation and Rehabilitation. Designs shall incorporate minimum AT/FP construction standards and required seismic rehabilitation techniques. See Subsection 4, Section 01010, GENERAL DESIGN - STRUCTURAL, for information on AT/FP and seismic requirements, and instructions on incorporating retrofits and rehabilitation measures in the proposal. See also Subsection 2, CIVIL DESIGN, for site upgrades required for AT/FP.

1.3. UEPH Module Interior Finishes.

1.3.1. Walls. There will be no exposed concrete masonry unit (CMU) walls in public areas or sleeping rooms. Provide a painted plaster skim coated CMU walls with one wall of a “tackable” fabric wall covering or painted gypsum wallboard. Exposed corners will be provided with a vinyl corner guard.

1.3.1.1. Tub and shower surrounds shall be solid surface polymer similar or equal to Corian® or ceramic tile 2134 mm (7 ft.) high minimum from finish floor or to ceiling. Solid surface polymer similar or equal to Corian® is preferred. Fiberglass is not allowed. Tub and shower surrounds shall extend a minimum of 102 mm (4 inches.) beyond the outer edges of tub.

1.3.2. Ceilings. Textured ceilings on exposed concrete or plaster ceilings will be provided in the sleeping/living rooms. Suspended acoustical tile ceilings will not be provided in the sleeping/living rooms.

1.3.3. Flooring and base. Sleeping/Living rooms will be carpeted. Entry areas into the sleeping/living rooms and the service area will be either ceramic tile or vinyl composition tile (VCT). Bathrooms floors will be ceramic tile. Ceramic tile shall conform to ANSI 137.1, moderate or heavy grade.

1.3.4. Cabinets

1.3.4.1. Service area cabinets shall be factory manufactured, and have adjustable shelves in wall cabinets. Countertops shall be solid surface polymer equal or similar to Corian®, plywood-core cove type, or plywood-core fully formed type with high pressure laminated plastic 1.1 mm (.043-inch) thick top and backsplashes with heat resistive adhesive. Countertops shall be fully formed at front and backsplash is preferable. Plywood shall be exterior grade with exterior glue. End splashes constructed of 19 mm (3/4-inch) plywood core shall be supplied. Solid surface polymer (Corian®) countertops are preferred. Cabinets shall conform to the requirement of the National Kitchen Cabinet Association except where modified below. Wall and base cabinets shall be medium density fiberboard (MDF). Exposed surfaces of laminated plastic cabinets shall be faced with decorative high pressure laminated plastic sheets a minimum of .71 mm (.028-inch) in thickness. Interior face of hinged doors shall be covered with minimum of .51 mm (.020-inch) thick laminated plastic liner and self edge bands shall be a minimum of .72 mm (.028-inch) thick. Plastic laminate shall conform to the requirements of NEMA LD3 and plastic laminate adhesive shall be contact type applied to both sides. Design of countertop space shall take into consideration a government-furnished full size microwave oven with spatial dimension of approximately 610 mm (2 feet) wide by 508 mm (20 inches) deep by 406 mm (16 inches) high.. Cabinets shall not be preservative treated.

1.3.4.2. Vanity countertops shall be solid surface polymer similar or equal to Corian or plywood-core with high pressure laminated plastic finish. Solid surface polymer similar or equal to Corian countertops with integral lavatories are preferred. Plywood shall be exterior grade with exterior glue. Backsplashes and endsplashes constructed of the same materials shall be provided. Countertop shall be 914mm (36

inches) minimum length and 560mm (22 inches) minimum depth and 914mm (36 inches) minimum height. Vanity cabinets shall be plywood-core similar to the construction of the kitchen cabinets and shall not be preservative treated. Vanity cabinets shall have a minimum of one (1) door and one (1) stack of two (2) drawers.

1.3.4.3. Cabinets construction. Construct cabinets with frame fronts and solid ends, or of frame construction throughout. Cabinet frame fronts, doors and drawers shall be constructed of solid hardwood with raised panel door construction. All other structural components of the cabinets shall be constructed of ANSI A208.2-1994 MDF. Frame members shall be mortised and tenoned, dove-tailed or doweled, and glued together. Brace the top and bottom corners with hardwood blocks that are glued with water-resistant glue and nailed in place. Wall and base cabinets shall be essentially of the same construction and outside appearance. Cabinets shall be constructed with frame fronts and solid ends, or of frame construction throughout. 19 mm (3/4-inch) by 38 mm (1-1/2 inch) kiln dried hardwood frame members, mortised and tenoned, dove-tailed or doweled, and glued together shall be provided. Top and bottom corners shall be braced with hardwood blocks that are glued with water-resistant glue and nailed in place. An integral toe space of at least 64 mm (2-1/2 inches) deep by 102 mm (4 inches) high on base cabinets shall be provided. Toe kick shall be plywood. Drawers shall be mounted on 20 gage metal side guides. Doors and drawers shall be beveled edges for operation without pulls or knobs. Minimum (nominal) thickness of materials for cabinet construction shall be as follows:

1.3.4.3.1. Cabinet backs: 4.8 mm (3/16-inch) MDF or 3.2 mm (1/8-inch) tempered hardboard. Sink cabinets shall have full backs. The full back requirement for sink backs may be omitted for handicapped units.

1.3.4.3.2. Bottoms of base cabinets and tops of wall cabinets: 13 mm (1/2-inch MDF; 13 mm (1/2-inch) MDF. Bottoms shall be supported on ends and on 610 mm (24-inch) centers.

1.3.4.3.3. Cabinet ends: MDF 16 mm (5/8-inch) shall be used for base cabinets and 10 mm (3/8-inch) shall be used for wall cabinets.

1.3.4.3.4. Cabinet Doors. 19 mm (3/4-inch) solid stock hardwood, clear grade for natural finish.

1.3.4.3.5. Drawer fronts: 19 mm s(3/4-inch) solid stock hardwood, matching doors.

1.3.4.3.6. Drawer bottoms: 13 mm (1/2-inch) MDF. On drawers over 381 mm (15 inches) wide, bottoms shall be braced with wood members glued in place.

1.3.4.3.7. Drawer sides and backs: 13 mm (1/2-inch) MDF.

1.3.4.3.8. Interior partitions or dividers: 16 mm (1/2-inch) MDF.

1.3.4.3.9. Shelves: 13 mm (5/8-inch) MDF. Shelves shall be supported on ends and on 610 mm (24-inch) centers. All shelves shall be full depth of cabinets.

1.3.4.4. Solid Polymer Countertops. Material shall be 19 mm (3/4 inch) thickness, cast, and filled nonporous solid surfacing composed of acrylic polymer, mineral fillers, and pigments. Superficial damage to a depth of 0.25 mm shall be repairable by sanding or polishing. Material shall comply with the following requirements:

1.3.4.4.1. Tensile Strength; 18.3 N/mm^2 (4100 psi) when tested in accordance with ASTM D 2583.

1.3.4.4.2. Hardness; Barcol Impressor 50 when tested in accordance with ASTM D 2583.

1.3.4.4.3. Flammability; rated Class I with a flame spread of 25 maximum and a smoke developed of 100 maximum when tested in accordance with ASTM E 84.

1.3.4.4.4. Boiling water resistance; no effect when tested in accordance with NEMA LD 3.

1.3.4.4.5. High temperature; no effect when tested in accordance with NEMA LD 3.

1.3.4.4.6. Liquid absorption; 0.06% maximum (24 hours) when tested in accordance with ASTM D 570.

1.3.4.4.7. Sanitation; National Sanitation Foundation approval for food contact in accordance with Standard 51 and approval for food area applications.

1.3.4.4.8/ Impact resistance; no failure for ball drop when tested in accordance with NEMA LD 3.

1.4. Windows.

1.4.1. Windows in sleeping/living rooms will be operable. The window design will conform with Anti-Terrorism/Force Protection and historic preservation requirements.

1.4.2. Sleeping/Living rooms will have a minimum glass window area that is equivalent to 10 per cent of the net floor area the window serves for natural light. A minimum of 50 per cent of the glass area will be operable for ventilation. Design strategies for glazing must consider the entire building design including but not limited to existing building orientation, heat gains and losses, shading and sun control, thermal comfort, ultraviolet control, and daylighting.

1.4.3. Windows will be furnished with horizontal or vertical blinds and/or drapery systems including tracks, carriers, and operators. The blinds and/or drapery systems will be included in the Comprehensive Interior Design (CID) package for this project.

1.5. Doors and Hardware. The selection of doors and hardware will receive careful attention in order to prevent future maintenance problems. The hard use and frequent abuse of doors will result in excessive maintenance problems, unless the doors and hardware are properly selected for the desired function and properly installed.

1.5.1. Provide module entry doors and sleeping/living rooms with stand-alone programmable electronic door locksets with audit capabilities. The lockset construction shall be all-metal, heavy-duty, and mortise. The lockset is equipped with an anti-pick latch and dead bolt, and a magnetic stripe reader complying with ISO standards and ABA dimensional specifications. Each magnetic stripe card will be programmed to gain access into its respective module and sleeping/living rooms, and into the common Soldier Community Building.

1.5.2. Doors between bathrooms, service areas, and sleeping/living rooms will be a minimum of 2 feet-4 inches wide. It is preferred that the module entry door and doors into the sleeping/living rooms be a minimum of 3 feet-0 inches wide and designed to accommodate the movement of furnishings. All swinging doors, except doors to linen closets, shall have a wall mounted door stop. Hinges acting as door stop or closer and door mounted stops are not acceptable. Provide solid wood backing in the stud wall cavity for wall mounted door stops. Except for the module entry and sleeping/living room doors, door hardware shall be bored-type conforming to ANSI A156.2, Series 4000, Grade 2.

1.5.3. Visitor Notification Device. All modules shall be provided with a door notification device alerting the resident a visitor is at the module entry door. Notification devices shall alert individual occupants of the sleeping/living rooms separately. The device shall be a combination chime and intercom system.

1.6. Electrical Requirements.

1.6.1. Three duplex receptacles and one quadraplex receptacle will be provided in each sleeping/living room and located to provide maximum accessibility to the residents. In addition, one duplex receptacle will be provided adjacent to each lavatory and three duplex receptacles will be provided in the service

areas as shown in the standard design package. Receptacles, outlets, wall switches, and related conduit shall not be surfaced mounted. Conduit shall not be exposed.

1.6.2. Lighting in sleeping/living rooms will be provided by wall or ceiling mounted fixtures. Indirect lighting systems are preferred.

1.6.2.1. Fluorescent lighting will be used to the maximum extent practicable. Walk-in closets may be provided with incandescent fixtures.

1.6.2.2. Bathroom fixtures will be provided with unbreakable lenses.

1.6.3. One entertainment television outlet will be provided in each sleeping/living room. All TV outlets will be located adjacent to a power receptacle.

1.6.3.1. Signal source for entertainment television will be local subscription service to a commercial CATV vendor. Information and requirements therefore will be obtained from Oceanic Cablevision and DOIM.

1.6.4. Telephone Service. A single non-administrative telephone outlet will be provided for each sleeping area so that each resident has access to an individual telephone line for personal use. Check with DOIM for specific requirements.

1.6.4.1. The location of cabinets and outlets for the telephone system will be coordinated with DOIM.

1.7. Mechanical Systems

1.7.1. Heating, Ventilation, and Air-Conditioning (HVAC) of UEPH modules will be accomplished by fan-ccoil units, variable air volume systems, or by other systems appropriate for the project based on a life-cycle cost analysis. Design shall comply with the requirments Of ETL 1110-3-455 titled, "*Humidity Control For Barracks and Dormitories in Humid Areas*". Central ducted systems are preferred if space allows for this.

1.7.2. Environmental Controls. These instructions apply to all UEPH building projects in which fan-coil units are to be installed, and provide guidance in the design of the HVAC system controls for the living/sleeping and bathroom areas for such personnel.

1.7.2.1. If fan coil units are selected as the best means to air condition the living modules, the fan-coil units will be either the horizontal type that are concealed in the ceiling plenum located above the entrance-way to the sleeping/living rooms, or floor mounted units.

1.7.2.2. Sleeping/living room temperature control is required to be achieved via thermostats that are installed either in the floor mounted fan-coil unit or wall mounted for the floor mounted or ceiling unit. The thermostats will be so located as not to be affected by the heat or cool from adjacent fan-coil valve package/piping or unconditioned fresh-air (duct to fan-coil unit). The thermostats will be located to sense the sleeping/living room temperature at all times when the fan-coil unit is operating. In addition, if operable windows are provided, then fan coil unit operation shall be interlocked with window position such that opening of the window will shut down FCU operation.

1.7.2.3. Occupant control of the air conditioning system space temperature control will be by thermostat and the operation of a multi-speed fan controller. The multi-speed fan controller will be installed in the floor mounted fan-coil unit or wall mounted for the ceiling unit. The multi-speed controller will be manually operated by the occupant to these positions: OFF, LOW, MEDIUM or HIGH.

1.7.2.4. Outside air intake to each fan-coil unit will be via a pre-conditioned air supply. The amount of air admitted will be adjustable to balance the system, but not by the room occupants. Where pre-conditioned outside air cannot be provided to each fan coil unit, FCU's shall be configured to have two

coil sections. The section receiving outside air shall be operated at full chill water flow at all times to allow for continuous moisture removal from this makeup/ventilation air. Chilled water flow through the other coil section shall be modulated using a modulated chilled water valve controlled by the space thermostat. In order to prevent overcooling of the space, space temperature control shall be by a two stage thermostat. Upon temperature drop in space 2 degrees below setpoint, an electric reheat coil (located in the supply plenum of the FCU) shall be energized in order to maintain space temperature. Reheat coil shall de-energize when space temperature is 1 degree below space temperature setpoint.

1.7.2.5. Cooling systems will be designed as a two-pipe system. Where UEPH buildings are sited such that the sleeping/living rooms have north and south exposures, the two-pipe system will be zoned to account for the exposure.

1.7.2.6. The bathroom exhaust fan system will be controlled by a manual on and off switch located in the bathroom or by a ducted central exhaust fan to ensure that minimum outside air requirements are met.

1.7.2.7. Where practical and cost effective, an air-to-air heat exchanger will be utilized to extract energy from the bathroom exhaust air to precondition the outside air supply to the fan-coil units.

1.7.2.8. Due to energy conservation features incorporated into current building designs, the proper air balance between the sleeping/living rooms fresh-air requirement and the bathroom exhaust air requirement is critical. Care will be taken to ensure that adequate exhaust air is provided to prevent moisture from accumulating in bathrooms.

1.7.3. Energy Conservation Requirements.

1.7.3.1 All electric control wiring required for each sleeping/living room fan-coil unit and corresponding bathroom exhaust system will be run to a separate and dedicated electric-electronic- panel or panels that will be located in the electrical or mechanical equipment room or both.

1.7.3.2. The thermostats will have the capability to control space temperature in each sleeping/living room during the cooling season. The thermostats will have the capability to direct and control other devices as required that in turn will maintain a space temperature of 23.8° C (75° F) at the center of the sleeping/living room and 1.5m (5 ft) above the finish floor. During the off season, the sleeping/living room space temperature will be allowed to fluctuate.

1.7.3.3. During the off season, the fan-coil units will operate to provide mechanical ventilation to the sleeping/living room as per the occupants positioning of the multi-speed fan switch in addition to the opening of windows.

1.7.3.4. Temperature setback and/or setup controls and devices will be installed where feasible to conserve electric energy when rooms or buildings are closed down or unoccupied for periods of time. A time clock device to cycle the system cooling pumps may be used in lieu of the temperature setback/setup program.

1.7.3.5. Instructions for occupant operation and maintenance of HVAC systems will be coordinated with the installation facilities engineer.

1.7.4. Plumbing Criteria.

1.7.4.1. The bathtubs will conform to Federal Specification WW-P-541/3B. Bathtubs will be acid-resisting enameled cast iron with slip-resistant bottoms conforming to ASME A112.19.1M., or porcelain enameled formed steel with structural composite reinforcement conforming to ASME A112.19.4M (structural reinforcement shall be in conformance with IAMPO Z124.1 including appendix). Enameled cast iron bathtubs are preferred.

1.7.4.2. Hot water temperatures. The actual measured temperatures of the hot water delivered to lavatories, and combination bathtubs and showers, or shower stalls in sleeping/living room bathrooms will not exceed 43.3° C (110° F).

1.8. **Fire Protection.**

1.8.1 General: Barracks shall conform with section 11 and the following.

1.8.2 Special Life Safety requirements:

1.8.2.1 Single room type dormitory rooms are classified as new hotel/dormitory occupancy. Only suite type dormitory rooms which have a living room or study room located between the sleeping room and corridor are classified as new apartment occupancy.

1.8.2.2 Any hotel/dormitory or apartment occupancy located on top of another occupancy such as business occupancy must be separated by minimum 1hr fire barrier and both stair exits must not egress through the business occupancy floor to reach the exterior exit doors, LSC.

1.8.3 Special Fire Sprinkler Requirements: Residential sprinkler heads to be used in all dwelling units, corridor and lobby, FSCR & FSC.

1.8.4 Special Fire Alarm Requirements: Smoke detector with sounder base (SDS) shall be provided in the intermediate room in all suites and in all sleeping rooms. SDS shall be connected to the fire alarm panel and be addressable type.

1.9. Sound Attenuation.

1.9.1 Testing. Certified proof-of-performance field tests will be conducted to demonstrate that the wall systems as constructed provide the required sound isolation. Tests for air-borne sound shall be made in compliance with ASTM E336. Tests for impact sound shall be made in compliance with ASTM E1007. Testing of 10 percent (minimum) of each type of floor and wall system is required. Location of test sites will be chosen at random by the Contracting Officer.

1.9.1.1. Any wall system found to be inadequate shall have the deficiencies corrected and the additional qualifying tests conducted at the contractor's expense. Testing at the contractor's expense of greater than 10 percent of each system may be required if the Contracting Officer determines that the quality of construction requires this additional testing.

1.9.2. Party walls shall be designed to provide the minimum airborne sound transmission ratings and impact isolation ratings stated in Table 1-2.

TABLE 1-2 - SOUND TRANSMISSION STANDARDS FOR WALL CONSTRUCTION

Area	FSTC[1]
Party Walls between Two Modules	52
Walls between Sleeping/Living Rooms in the Same Modules	52
Walls between Sleeping/Living Rooms and Bathrooms	52

Note[1]: Field Sound Transmission Class. See ASTM E336.

1.9.3. Insulation. Insulation shall be provided to meet the following requirements: Thermal and sound insulation shall have a flame spread rating of 25 or less and a smoke development rating of 50 or less exclusive of the vapor barrier when tested in accordance with ASTM E 84. A vapor barrier shall be provided on the warm side of exterior and ceiling insulation for thermal insulation. Urethane is not allowed as an insulation material.

1.10. Signage.

1.10.1. Each sleeping/living room will be provided with an unobtrusive identification number to aid in key control. Each sleeping/living room door will be provided with an insert frame permanently affixed at eye level. Insert frames will be suitable for receiving identification cards of the room occupants.

1.10.2. In addition to the sleeping/living room door identification, signage must be provided at the entry door of module identifying one or two occupants, and coordinated with the visitor notification device.

2. BRIGADE HEADQUARTERS (Building 649).

2.1. Brigade Headquarters (BDE HQ). The Brigade Headquarters is an administrative type facility. The BDE HQ will be located on the second floor of Building 649.

2.2. Design Requirements.

2.2.1. Standard Drawings. The Center of Standardization (COS) for brigade headquarters is the Sacramento District Engineer Office. The Department of Army (DA) Standard Design Package for Brigade Headquarters will be used when designing this project. Designs will be based on the functional relationships of the DA standard design package. The existing building configuration, partition locations, pipe chases, structural columns, and window locations may limit the possibility of meeting the BDE HQ space criteria in all cases. Each project will be based on sound architectural and engineering judgment to ensure the maximum use of existing assets within authorized funds.

2.2.2. There are five distinct areas of concern: function (what the building is to do in terms of space requirements and relationships); aesthetics (what the building should look and feel like); technology (how it can be built, control of interior environment and selection of materials); economics (the limitations of the budget); and sustainable design (integrated design emphasizing environmental stewardship).

2.2.3. Antiterrorism/Force Protection (AT/FP) and Seismic Evaluation and Rehabilitation. Designs shall incorporate minimum AT/FP construction standards and required seismic rehabilitation techniques. See Subsection 4, Section 01010, GENERAL DESIGN - STRUCTURAL, for information on AT/FP and seismic requirements, and instructions on incorporating retrofits and rehabilitation measures in the proposal. See also Subsection 2, CIVIL DESIGN, for site upgrades required for AT/FP.

2.3. Functional Areas.
Space will be provided for a command section, S-1, S-2, S-3, S-4, S-6, SPO (Support Operations), MCO, DMOC (Division Medical Operational Center), Legal Office, Equal Opportunity Office, Reenlistment Office, service core and support services. Private offices will be provided for the commanding officer, executive officer, command sergeant major. Space will also be provided for clerical and central files, conference room, duty officer, information management systems room “concentrator room”, message center and mail sorting, reception, secure documents (crypto vault), supplies, toilet facilities, and vending machine area.

2.3.1. The command section provides space for a commander’s office, offices for the executive officer and command sergeant major, a reception area, coffee area and toilet room. Two conference rooms are required. A conference room seating approximately 50 people and smaller conference room seating 15 around a large conference desk that is adjacent to the commander’s office.

2.3.2. S-1 areas include a office for the S-1 officer, clerical/central files area, a message center and mail sorting and a room for the duty officer. Private offices will also be provided for the NCOIC. Open office area will accommodate clerical-type personnel. A room is required to store office supplies.

2.3.3. S-2 areas encompass an office for the S-2 officer, clerical/central file and work area. A private office will also be provided for the NCOIC. Open office area will accommodate clerical-type personnel. A room is required to store office supplies.

2.3.4. S-3 areas encompass an office for the S-3 officer, clerical/central file and work area. Private offices will also be provided for the NCOIC, MCO officer, MCO NCOIC, SPO officer, SPO NCOIC, Chemical Officer, Force Integration Officer, and School NCO. Open office area will accommodate clerical-type personnel. A room is required to store office supplies.

2.3.5. S-4 areas includes an office for the S-4 officer, clerical/central file and work area. Private offices will also be provided for the Maintenance NCOIC, Food Service officer, and Supply NCOIC. Open office area will accommodate clerical-type personnel. A room is required to store office supplies.

2.3.6. S-6 areas includes an office for the S-6 officer, clerical/central file and work area. Private offices will also be provided for the NCOIC. Open office area will accommodate clerical-type personnel. A room is required to store office supplies.

2.3.7. DMOC (Division Medical Operations Center) areas includes an office for the DMOC officer, clerical/central file and work area. Private offices will also be provided for the Surgeon, Logistics officer, Operations officer, Evacuation officer and MEB NCOIC. The Surgeon office requires an adjacent private examination room. Open office area will accommodate clerical-type personnel. A room is required to store office supplies.

2.3.8. The Legal area includes an office for the Legal officer, clerical/central file and work area. Private offices will also be provided for the NCOIC. Open office area will accommodate clerical-type personnel. Built-in wall shelves are required for reference books. A room is required to store office supplies.

2.3.9. The Reenlistment area includes 4 offices. Open office area will accommodate clerical-type personnel. A room is required to store office supplies.

2.4. Provisions for Physically Handicapped Individuals.

2.4.1. Brigade Headquarters will be designed for physically handicapped individuals. This facility will be located on the second floor of Building 649. This project requires compliance with the current version of ADAAG (ADA Accessibility Guidelines) only as issued by the Access Board under 36 CFR Part 1191 and excludes the full ADA implementing rules issued by the Department of Transportation and Department of Justice.

2.4.2. Cooperative Review Program. Under a cooperative review program, the Eastern Paralyzed Veterans Association (EPVA) will review any USACE project design for compliance with the criteria defined in UFAS and ADAAG. This review service has been provided to USACE commands by EPVA since 1979. The reviews are provided without fee and are completed in an average of 15 days. Reviews by EPVA are not mandatory but are encouraged.

Eastern Paralyzed Veterans Association
75-20 Astoria Boulevard
Jackson Heights, NY 11370-1178
Voice: (718) 803-3782
FAX: (718) 803-0414
Internet: http://www.epva.org/

2.5. Fire Protection. Provide sprinkler protection throughout the building and a fire alarm system in accordance with section 01010, subsection 8, Fire Protection.

2.5.1 General: Brigade headquarters shall conform with section 01010, subsection 8, Fire Protection.and the following.

2.5.2 Special Life Safety requirements: None.

2.5.3 Special Fire Sprinkler Requirements: None.

2.5.4 Special Fire Alarm Requirements: None.

3. BATTALION HEADQUARTERS (Building 649)

3.1. Battalion Headquarters (BN HQ). The Battalion Headquarters is an administrative type facility. The BN HQ will be located on the third floor of Building 649. The BN Troop Aid Station will located on the first floor of Building 649, and the BN classrooms will be located on the third floor of Building 650.

3.2. Design Requirements.

3.2.1. Standard Drawings. The Center of Standardization (COS) for battalion headquarters is the Sacramento District Engineer Office. The Department of Army (DA) Standard Design Package for Battalion Headquarters will be used when designing this project. Designs will be based on the functional relationships of the DA standard design package.

3.2.2. The standard size for a small battalion headquarters with classrooms and a troop aid station is 1,245 m^2 (13,401 ft^2). The existing building configuration, partition locations, pipe chases, structural columns, and window locations may limit the possibility of meeting the BN HQ space criteria in all cases. However, each project will be based on sound architectural and engineering judgment to ensure the maximum use of existing assets within authorized funds. There are five distinct areas of concern: function (what the building is to do in terms of space requirements and relationships); aesthetics (what the building should look and feel like); technology (how it can be built, control of interior environment and selection of materials); economics (the limitations of the budget); and sustainable design (integrated design emphasizing environmental stewardship).

3.2.3.. Functional Areas.

3.2.3.1. Space will be provided for a command section, S-1/PAC, S-2, S-3, S-4, chaplain and assistant chaplain, classroom and service core. Private offices will be provided for the commanding officer, executive officer, command sergeant major, S-1 officer, S-2 officer, S-3 officer, S-4 office, chaplain, and assistant chaplain.

3.2.3.2. Space will also be provided for clerical and central files, conference room, duty officer, information management systems room “concentrator room”, message center and mail sorting, reception, resource center, secure documents (crypto vault), supplies, toilet facilities, and vending machine area.

3.2.3.3. Classrooms will be located in Bldg. 650 on the third floor. The major third floor area will contain the classrooms and a learning resource center. The major floor area will be divided into five sections. Four of the sections will be designed for classrooms. The fifth section will be designed for the learning resource center. Handicapped accessibility will be provided for the classrooms.

3.2.3.3.1. Each of the four classroom sections will have ceiling hung, flat panel operable partitions (without floor tracks) having a minimum 40 STC rating to subdivide the classroom section into one, two, or three classrooms. Sound insulation will also be provided above the operable partition to prevent noise flanking.

3.2.3.3.2. Each classroom shall be designed for 100 students seated with individual tables and chairs. Each classroom shall have a closet area for the storage of tables and chairs. Each classroom shall have separate entrances and exits.

3.2.3.4. The Troop Aid Station will be located on the first floor of Building 649. Space will be provided for a doctor, NCOIC, Medical Officer, Physician Assistant, Working Stock Storage, and Deployment Stock Storage. Private offices will be provided for the doctor, NCOIC, physician assistant, working stock storage and deployment storage. An examination area will be provided in the doctor’s office. Functional relationships of these areas are found in the referenced standard drawings.

3.2.4. Antiterrorism/Force Protection (AT/FP) and Seismic Evaluation and Rehabilitation. Designs shall incorporate minimum AT/FP construction standards and required seismic rehabilitation techniques. See Subsection 4, Section 01010, GENERAL DESIGN - STRUCTURAL, for information on AT/FP and seismic requirements, and instructions on incorporating retrofits and rehabilitation measures in the proposal. See also Subsection 2, CIVIL DESIGN, for site upgrades required for AT/FP.

3.3. Provisions for Physically Handicapped Individuals.

3.3.1. Battalion Headquarters will be designed for physically handicapped individuals. This facility will be located on the third floor of Building 652. This project requires compliance with the current version of ADAAG (ADA Accessibility Guidelines) only as issued by the Access Board under 36 CFR Part 1191 and excludes the full ADA implementing rules issued by the Department of Transportation and Department of Justice.

3.3.2. Military exclusion. Any building or facility that is specifically restricted by occupancy classification to use only by able-bodied military personnel during the expected useful life of the building or facility need not be accessible. This exclusion does not apply to those portions of buildings or facilities that may be open to the public or that may be used by individuals with disabilities employed or seeking employment at such buildings of facilities.

3.3.3. Cooperative Review Program. Under a cooperative review program, the Eastern Paralyzed Veterans Association (EPVA) will review any USACE project design for compliance with the criteria defined in UFAS and ADAAG. This review service has been provided to USACE commands by EPVA since 1979. The reviews are provided without fee and are completed in an average of 15 days. Reviews by EPVA are not mandatory but are encouraged.

Eastern Paralyzed Veterans Association
75-20 Astoria Boulevard
Jackson Heights, NY 11370-1178
Voice: (718) 803-3782; FAX: (718) 803-0414; Internet: http://www.epva.org/

3.4. Fire Protection. Provide sprinkler protection throughout the building and a fire alarm system in accordance with section 01010, subsection 8, Fire Protection..

3.4.1 General: Battalion headquarters shall conform with section 01010, subsection 8, Fire Protection, and the following.

3.4.2 Special Life Safety requirements: None.

3.4.3 Special Fire Sprinkler Requirements: None.

3.4.4 Special Fire Alarm Requirements: None.

4. COMPANY OPERATIONS FACILITY (Bldg. 650).

4.1. Company Operations Facility (COF). The Standard Design Company Operations Facility (COF) is composed of an administrative and a maintenance area with an arms vault. The COF administrative areas for Quad F will be physically separated for their maintenance areas. Six (6) COF administrative areas and four (4) COF maintenance areas are required.

4.1.1. Five (5) COF administrative areas will be located on the second floor of Building 650, and the sixth COF administrative area will be located on the third floor of Building 649. The units identified for Building 650 are the 725th MSB HQ & A Company, B Company, C Company, D Company, and 71st Chemical Company. Headquarters and Headquarters Company, HHC DISCOM (Division Support Company) is the company identified for the third floor of Building 649.

4.1.2. Four (4) COF maintenance areas with arms vault will be located on the first floor of Building 649. The units identified for these spaces are the 725th MSB HQ & A Company, B Company, C Company and D Company.

4.2. Design Requirements.

4.2.1. Standard Drawings. The Center of Standardization (COS) for company operations facilities is the Savannah District Engineer Office. The Department of Army (DA) Standard Design Package for company operations facilities will be used when designing this project. Designs will be based on the functional relationships of the DA standard design package.

4.2.2. The existing building configuration, partition locations, pipe chases, structural columns, and window locations may limit the possibility of meeting the COF space criteria in all cases. However, each project will be based on sound architectural and engineering judgment to ensure the maximum use of existing assets within authorized funds. There are five distinct areas of concern: function (what the building is to do in terms of space requirements and relationships); aesthetics (what the building should look and feel like); technology (how it can be built, control of interior environment and selection of materials); economics (the limitations of the budget); and sustainable design (integrated design emphasizing environmental stewardship).

4.2.3. Functional Areas of a Typical Company Operations Facility.

4.2.3.1. Administration Area (Building 650). Space will be provided for private offices for the company commander, executive officer, training office, platoon administration, and the first sergeant. In addition, space will be provided for an open administration office, conference and classroom, entry and waiting area, janitor's closet, storage room (office files and supplies), and toilet facilities.

4.2.3.2. Operations Area (Building 649). Space will be provided for an air conditioned arms vault; communications (COMMO) storage; equipment maintenance; information management systems room "concentrator room"; Nuclear, Biological and Chemical (NBC) equipment storage; unit storage; general storage; individual lockers for TA-50 gear storage; and shower and toilet facilities.

4.2.4. Antiterrorism/Force Protection (AT/FP) and Seismic Evaluation and Rehabilitation. Designs shall incorporate minimum AT/FP construction standards and required seismic rehabilitation techniques. See Subsection 4, Section 01010, GENERAL DESIGN - STRUCTURAL, for information on AT/FP and seismic requirements, and instructions on incorporating retrofits and rehabilitation measures in the proposal. See also Subsection 2, CIVIL DESIGN, for site upgrades required for AT/FP.

4.3. Provisions for Physically Handicapped Individuals. Company operations facilities are intended to be used and occupied by able-bodied soldiers only. The company operations facilities will not be designed to be accessible for the physically handicapped.

4.4. Fire Protection. Provide sprinkler protection throughout the building and a fire alarm system in accordance with section 01010, subsection 8, Fire Protection.

4.4.1. General: Company operations shall conform with section 01010, subsection 8, Fire Protection.and the following.

4.4.2. Special Life Safety requirements: None.

4.4.3. Special Fire Sprinkler Requirements: None.

4.4.4. Special Fire Alarm Requirements: None.

5. ENLISTED PERSONNEL DINING FACILITY (Bldg. 650).

5.1. Enlisted Personnel Dining Facility (DFAC). The dining facility for enlisted personnel will employ cafeteria-style service and will be equipped to allow for service of both full menu and short order, fast food types of meals, carry-out and ala carte.

5.1.1. The major functional areas to be provided in the DFAC are dining, dish washing, employee lockers and toilets, food preparation and cooking, garbage and trash disposal, non-provisional storage, patron toilets, office(s), pot and pan washing, receiving platform, refrigerated and dry storage, serving, and signature-head count, cashier station(s), and staging area. Space for entry canopies for climate control and receiving platforms are included in this project.

5.1.2. The DFAC will be constructed on the first floor of Building 650. Development of the dining facility will follow standard guidelines developed by the Norfolk District Engineer Office. The existing building configuration, partition locations, pipe chases, structural columns, and window locations may limit the possibility of meeting the standard space criteria in all cases. However, each project will be based on sound architectural and engineering judgment to ensure the maximum use of existing assets within authorized funds. There are five distinct areas of concern: function (what the building is to do in terms of space requirements and relationships); aesthetics (what the building should look and feel like); technology (how it can be built, control of interior environment and selection of materials); economics (the limitations of the budget); and sustainable design (integrated design emphasizing environmental stewardship).-
5.1.3. The DFAC will be based on the 501-800 Enlisted Personnel Dining Facility standard design drawings.

5.2. Design Requirements. The design objective is to achieve approximately new space criteria and construction standards.

5.2.1. Provisions for Physically Handicapped Individuals. Enlisted personnel dining facilities are required to be designed for physically handicapped individuals.

5.2.2. Interior Design. A Comprehensive Interior Design (CID) package will be provided for the dining facility. Chairs, tables, banners, decorative accessories will not be contractor procured items. Funds for these items are centrally managed by ATSM-CES-OE. The CID package will be prepared and closely coordinated with the Installation Food Service Advisor and ACES office to ensure that items of décor are requisitioned and delivered prior to the building occupancy.

5.2.3. Floors and Flooring Materials.

5.2.3.1. Floors with floor drains will be properly but not excessively sloped to the drains without causing a safety hazard. All penetrations through floors will be properly sealed to prevent entry or harborage by vermin.

5.2.3.2. The dining area standard floor material is vinyl composition tile (VCT). Quarry tile floors will not be provided in dining areas, but be provided in dish washing areas, kitchen areas, pot and pan washing areas, serving line work areas, self-service areas, and field food service equipment staging areas, and dry storage rooms.

5.2.3.2.1. The quarry tile will be the abrasive surface type as stated in the Tile Council of American Standard 137.1 (Ceramic Tile). Epoxy coatings, linoleum, vinyl and VCT are not acceptable substitutes for quarry tile. Grouting material for quarry tile shall be a grout system employing epoxy resin and hardener portions especially formulated for commercial installations where chemical resistance is important.

5.2.3.3. Ceramic tile floors will be provided in patron toilet rooms and employee toilet and locker rooms. All other floor finishes will be the minimum necessary to provide complete, functional, and sanitary facilities.

5.2.4. Interior Partitions. Designers of dining facilities should anticipate building and equipment abuses and provide protective measures to minimize such damages. Attention to details, coordination between the various architectural and engineering disciplines and local food service operators will help minimize the problem.

5.2.4.1. All exposed corners of glazed structural units (GSU) and concrete masonry units (CMU) partitions and columns subject to damage from portable food service equipment will be provided with stainless steel guards or other protective measures. The protective guards will extend to a height not less than 1830 mm (6 feet) above the finish floor.

5.2.4.2. Walls and columns immediately adjacent to portable food service equipment in serving line and self-service areas will be protected from damage. Metal, plastic, or rubber horizontal rails securely fastened to the columns and walls or other adequate protective measures will be provided at heights above the finish floors necessary to prevent damage whenever the equipment is moved for maintenance purposes.

5.2.4.3. Partition bases, corners, and junctions with other partitions will be coved to facilitate cleaning operations.

5.2.4.4. Gypsum wallboard on steel studs will not be used in dish washing areas, kitchen areas, serving areas, self-serve areas, storage areas, pot and pan washing areas, and toilet areas, or other areas subject to water damage or high humidity. Gypsum wallboard will not be used in areas where mobile food service equipment is located.

5.2.4.5. Glazed structural units (GSU) or ceramic tile will be provided in dish washing areas, kitchen areas, pot and pan washing areas, serving line work areas, and field food service equipment staging areas. Painted CMU is not an acceptable substitute for GSU.

5.2.4.6. Dropped partitions will be provided above serving lines. The bottom of the partitions will be 2030 mm (6 ft 8 inches) above the finish floor.

5.2.4.7. A cased opening will be provided for pass-through refrigerators between kitchen areas and serving line work spaces.

5.2.5. Doors and Hardware. The selection of doors and hardware will receive careful attention to prevent future maintenance problems. The hard use and frequent abuse of doors can result in excessive maintenance problems, unless the doors and hardware are properly selected, specified, and installed for the desired function.

5.2.5.1. Doors between dish washing areas, dry storage areas, kitchen areas, serving areas, and receiving platforms will not be less than 16-gage steel with applied metal bumpers, 406 mm (16 inch) high kickplates, and door closures. These doors will be provided with see-through safety glass lights.

5.2.5.2. Other frequently used doors will be provided with kick-plates and closures. Patron entrance and exit doors will be provided with door closures.

5.2.5.3. Double acting doors will be provided between kitchen and serving line work areas. These doors will have a 1525 mm (60 inch) clear opening width and be provided with see-through safety glass lights.

5.2.5.4. Walk-in refrigerator doors will be provided with cylinder locks and interior safety release handles. These doors will be 915 mm (3 feet) wide by 2134 mm (84 inches) high. Door stops will be

provided to prevent walk-in refrigerator doors from striking adjacent food service equipment, plumbing fixtures, or walls.

5.2.5.5. The clear width of doors to dish washing rooms will not be less than 1016 mm (40 inches).

5.2.5.6. Raised thresholds will not be installed at doorways between dish washing areas, dry storage areas, kitchen areas, serving line areas, refrigerated areas, and receiving platform areas.

5.2.6. Windows. Windows will be provided with blinds.

5.2.7. Ceilings.

5.2.7.1. Ceiling heights in dish washing areas will be compatible with the dish washing equipment. Clearance is required for removal of the inspection doors on the dish washing machines.

5.2.7.2. Plastic laminate suspended acoustical ceiling tile is the required ceiling material in dish washing areas, dry storage areas, kitchen areas, pot and pan washing areas, serving line work areas, and field food service equipment staging areas.

5.2.8. Acoustical Treatment. Acoustical consideration will be given in the design of high-noise areas in order that noise levels will not exceed the requirements of TB MED 501 (Occupational and Environmental Health: Hearing Conservation, March 1988 or latest edition) and the Occupational Safety and Health Act (OSHA).

5.2.9. Exhaust Ventilation.

5.2.9.1. Mechanical exhaust ventilation will be provided in dish washing areas, dry storage areas, enclosed can washing areas, kitchen areas, pot and pan washing areas, serving areas, toilet and locker rooms, utility rooms, and staging areas.

5.2.9.2. Make-up air for serving line areas will be taken form areas adjacent to the serving lines. Separate make-up will be provided for dish washing areas, pot and pan washing areas. Make-up fans will be interlocked electrically with exhaust fans.

5.2.9.3. Grease extracting hoods will be installed at 2032 mm (6 ft 8 inches) above the finish floor.

5.2.9.4. Dish washing and pot and pan washing areas will be provided with exhaust ducts and registers in the ceilings to provide ventilation to clear moist air near the ceiling. The systems will be designed as an integral part of the machine exhaust system.

5.2.9.5. The ventilation rate in dish washing and pot and pan washing rooms will be not less than 20 air changes per hour or as recommended by the machine manufacturer, whichever is greater.

5.2.9.6. Evaporative cooling is authorized where effective. Spot air-conditioning or air conditioning may also be provided to keep the work areas at 29.4° C (85° F) in accordance with ASHRAE recommendations if air-conditioning is allowed and the criteria for exhaust ventilation are met.

5.2.10. Refrigeration.

5.2.10.1. Walk-in prefabricated refrigerators and freezers will be provided with emergency quick-release hardware and an emergency signal system. The signal system will consist of a buzzer alarm on the exterior of the walk-in refrigerator or freezer. Activation of the buzzer alarm must be possible from inside the refrigerator or freezer.

5.2.10.2. Refrigeration equipment will be designed to maintain the temperatures and relative humidities shown in Table 5-1, Refrigeration Equipment.

TABLE 5-1 REFRIGERATION EQUIPMENT			
TYPE OF FOOD	TEMPERATURE		RELATIVE HUMIDITY
	°C	°F	
Chilled Fruit and Vegetables	3.3	38.0 ± 2	90 percent ± 5% relative humidity
Dairy	1.7	35.0 ± 2	80 percent ± 5% relative humidity
Freezer	-23.3	-10.0 ± 2	
Meat	0.0	32 to 35	
Prepared Foods and Ingredients	3.3	38.0 ± 2	

5.2.10.3. A minimum of 50 mm (2 inches) of rigid insulation will be provided under walk-in prefabricated refrigerators and freezers. The insulation will be turned up 90 degrees around the perimeter of the refrigerator or freezer.

5.2.10.4. Cold storage refrigeration systems will use the unregulated HCFC-22 as refrigerant. Depending on the applications, either single stage or two-stage HCFC-22 systems may be used. The selection will be based on equipment availability, the lowest life cycle cost, and system operation, maintenance, and repair requirements.

5.2.10.5. To prevent the unnecessary release of refrigerant into the atmosphere, the design will include provisions to retain, reuse, and reclaim refrigerants during maintenance.

5.2.11. Air Curtain Fly-Control Machines.

5.2.11.1. Air curtain fly-control machines will be installed over personnel entrance and exit doors, including receiving platform vestibule doors, but not over emergency exit doors from dining areas.

5.2.11.2. The machines will extend the full width of the doors and be installed on the building exterior immediately above the door headers. The machines will be activated automatically when the doors are opened. The air current will be directed away from the door entrance at approximately 15 degrees, or as recommended by the manufacturer. The air velocity, measured at 900 mm (3 feet) above the finish floor, will be at least 3000 mm/sec (600 ft per minute) for personnel entrance doors and at least 8130 mm/sec (1600 ft per minute) for service entrance doors. Close coordination with placement of doors/windows is critical.

5.2.12. Electrical Criteria.

5.2.12.1. Electrical Receptacles and Outlets.

5.2.12.1.1. Electrical receptacles mounted on conduit stub-ups extending above or flush mounted with the finish floor WILL NOT be installed in kitchen areas, serving line work areas, or self-service areas for safety reasons. Instead, ceiling cord reels will be provided in these areas rather than flush mounted or stub-up receptacles.

5.2.12.1.2. Waterproof electrical receptacles will be provided in all areas subject to wet cleaning methods, such as in kitchens, serving line, self-service, dish washing, pot and pan washing, and cart and can washing areas. These receptacles will be installed not less than 1220 mm (4 feet) above the finish floor, except in areas where serving line tray slides are installed since they are less than 1220 mm (4

feet) high. Ground fault circuit interrupting protection will be provided in accordance with the National Electrical
Code.

5.2.12.2. Lighting.

5.2.12.2.1. Regular or deluxe warm-white fluorescent lamps will be provided for general lighting in areas where it is desirable to emphasize the color and attractiveness of food, such as dining areas, display counters, salad bars, self-service areas, and serving lines.

5.2.12.2.2. Cool-light, such as regular or deluxe cool-white fluorescent lamps, will be provided in all areas where discrimination between colors is essential, such as dessert, meat, salad and vegetable preparation areas, main cooking areas, and pastry and roll baking areas. Cool-white lighting will be provided in dish washing, pot and pan washing, and can washing areas.

5.2.12.2.3. Incandescent light fixtures may be used only for architectural effect and in refrigeration and freezer areas. Incandescent light fixtures will not be used for general lighting.

5.2.12.2.4. Light fixtures in dish washing areas, cart and can washing areas, and pot and pan washing areas will be gasketed and vapor-proofed. Lenses for light fixtures in areas where food is cooked will be shatterproof glass. In areas where food is served or stored, lenses will be acrylic plastic with protective shields. Light fixtures in walk-in prefabricated refrigerators and freezers will be gasketed, vapor-proof type with protective shields that automatically turn off when the doors are closed.

5.2.12.2.5. Lighting levels will be in accordance with the ranges contained in DFAC standard design.

5.2.12.3. Communications and Sound Systems.

5.2.12.3.1. A public address and sound system will be provided in dining areas for the transmission of announcements and broadcast of recorded material. The entire system will be provided: components, conduit, cables, microphones, receivers, speakers, audio equipment, etc. The controls for the intercommunications, public address, and sound system will be located in the DFAC office.

5.2.12.3.2. An intercommunication system with paging capability will be provided at the signature head count station.

5.2.12.3.3. Administrative telephones will be provided as required.

5.2.13. Sinks and Waste Disposal.

5.2.13.1. Hand lavatories in all work areas will be stainless steel and be equipped with blade-type wrist-operated lever faucets. Hand lavatories will not be provided with foot- or knee-operated controls.

5.2.13.2. Pot and Pan Washing Areas. A four-compartment sink will be provided with 60° C (140° F) hot water supplied to three compartments, and 82.2° C (180° F) hot water supplied to the fourth compartment. Each compartment will be a minimum of 600 mm by 600 mm (2ft x 2 ft). Soiled ware counters will be provided with flexible prewash faucets and heavy duty disposal machines or scraping troughs with basket strainers if disposal machines can not be installed because of inadequate sanitary sewer systems. Prewash faucets will be protected against back siphonage. Stainless steel wire baskets will be provided for immersion in the fourth compartment. Booster heaters will be provided to deliver the proper water temperatures. An under-sink heater with an indicating thermometer will be provided under the fourth compartment. An automatic chemical sanitizing agent feeder will be provided for the fourth compartment to be used, as needed, in lieu of hot water, The sink unit and counters will be mounted against the walls and sealed and provided with a sound deadening undercoating.

5.2.13.3. Vegetable Preparation Areas. A two-compartment sink with counter will be provided in vegetable preparation areas and mounted against the walls and sealed. The sink and counter will be provided with a sound deadening undercoating. A waste disposal machine will also be provided.

5.2.13.4. Field Feeding Equipment Staging Areas. A pot and pan sink booster will be provided to deliver 82.2° C (180° F) hot water through a hose-bib for field feeding equipment staging areas.

5.2.14. Water Supply.

5.2.14.1. Provide water at temperatures as shown in Table 5-2. Provide booster heaters sized to provide an adequate quantity of hot water.

TABLE 5-2 WATER TEMPERATURES

FUNCTION DESCRIPTION	Temperature	
	°C	°F
Hand Lavatories	37.7	100
Mechanical Dish Washing Equipment	82.2	180
Pot and Pan Washing Equipment	82.2	180
Pot and Pan Washing Area	60.0	140
Cart and Can Washing Areas	60.0	140
Pressure Spray and Sanitizing Equipment	82.2	180
Field Food Service Equipment Staging Areas	82.2	180

5.2.14.1. Hot water lines exposed in work areas will be insulated and protected with stainless steel metal jackets, in particular, exposed lines to dish washing machines.

5.2.15. Floor Drains.

5.2.15.1. Floor drains will be provided in cart and can washing areas, dish washing areas, kitchen areas, pot and pan washing areas, self-service areas, serving line work areas, pot rack storage areas, and toilet rooms. The floors will be sloped to the drains to facilitate cleaning operations.

5.2.15.2. Floor drain troughs will be provided in front of compartment and hand sinks, doors to walk-in prefabricated refrigerators and freezers, frying and braising pans, rinse-sanitizers, and steam kettles.

5.2.15.3. Floor drain troughs in front of frying and braising pans, steam kettles, and other grease producing equipment will drain into a central grease trap and not into the main sewer system.

5.2.15.4. Floor drain troughs for steam kettles, and twin five-gallon kettles will be positioned directly under the drain-out faucets. Floor drain troughs for frying and braising pans will be located so that the contents will spill directly into them.

5.2.16. Gas. Gas supplied food service equipment will be provided with flexible connectors and quick-disconnect couplings. Gas lines will not be permanently attached to gas supplied equipment.

5.2.17. Health and Sanitation.

5.2.17.1. The current Food Service Sanitation Regulations established by the Food and Drug Administration, U.S. Department of Health and Human Services, applicable National Sanitation Foundation Standards, and AR 40-5 (Preventive Medicine) will be used as minimum standards for all

facets of design, including the selection of food contact surfaces, interior surfaces, and food service equipment, as well as the installation of the equipment.

5.2.17.2. Sanitary sewer lines SHALL NOT be installed above eating areas, kitchen areas, serving areas, or storage areas, either covered or exposed.

5.2.17.3. Unnecessary horizontal surfaces and ledges, and inaccessible spaces will be avoided to facilitate cleaning and provide sanitary conditions

5.2.18. Receiving Platforms.

5.2.18.1. Receiving platforms will be 1220 mm (4 feet) high and 3050 mm (10 feet) deep. The vertical distance between the truck maneuvering areas at the platform and the canopy above will not be less than 4420 mm (14 ft 6 inches). The platform areas will be free of columns. Dock levelers will be provided. Placement of levelers will be installed to allow more than one vehicle in the loading dock are at once.

5.2.18.2. A recessed cleaning area with a floor drain will be provided for mop cleaning. Hot water and pressure spray cleaning equipment will be provided for cleaning garbage cans, mops, racks, and the receiving platform. An enclosed and secure area will be provided for storing spray cleaning equipment.

5.2.19. Trash Removal. The number and type of garbage and trash receptacles required to adequately serve the facility will be coordinated with the using agency. Garbage and trash receptacles will be located in accordance with anti-terrorism and force protection criteria.

5.2.20. Antiterrorism/Force Protection (AT/FP) and Seismic Evaluation and Rehabilitation. Designs shall incorporate minimum AT/FP construction standards and required seismic rehabilitation techniques. See Subsection 4, Section 01010, GENERAL DESIGN - STRUCTURAL, for information on AT/FP and seismic requirements, and instructions on incorporating retrofits and rehabilitation measures in the proposal. See also Subsection 2, CIVIL DESIGN, for site upgrades required for AT/FP.

5.3. Food Service Equipment.

5.3.1. Food service equipment that is permanently built-in or attached to the facility, including items with fixed utility connections, will be provided. Equipment that is portable or can be detached from the facility without tools will be government furnished and installed. All food service equipment will be clearly identified by classes and coordinated with ACES.

5.3.2. The design and installation of food service equipment will conform to the standards of the National Sanitation Foundation. The design and installation of electrically-operated equipment will conform to the standards of the Underwriters' Laboratories, Inc. The design and installation of gas-operated equipment will conform to the standards of the American Gas Association.

5.3.3. Class A Equipment. Class A equipment is installed equipment that is affixed to or built into a dining facility as an integral part of the facility. The equipment will be provided as part of the construction. Class A equipment will be contractor furnished and contractor installed.

5.3.4. Class B Equipment. Class B equipment is government furnished and contractor installed equipment. The equipment installation cost will be part of the project.

5.3.5. Class C Equipment. Class C equipment is movable in nature and not affixed or built into a dining facility as a integral part of the facility. The equipment will be government furnished and installed. While the cost of the equipment and installation will not be part of the project, the contractor is still responsible to identify the Class C equipment. A list and description of the Class C equipment will be provided to the using service in a timely manner to ensure the equipment is requisitioned and delivered prior to the building occupancy.

5.3.6. Special Requirements

5.3.6.1. Serving and self-service lines will be equippped with fixed non-removable tray slides and sneeze guards. Sneeze guards will be at a height that permits the server direct access for passing plates to the patrons at any point on the line.

5.3.6.2. The exterior surfaces of walk-in prefabricated refrigerators will be provided with protective horizontal rails to prevent damage from mobile food preparation tables.

5.3.6.3. The dish washing system will be the double tank straight-through type in accordance with MIL-D-1390 (Dish Washing Machine, Single Tank and Double Tank Commercial, latest version).

5.4. Fire Protection. Provide sprinkler protection throughout the building and a fire alarm system in accordance with section 01010, subsection 8, Fire Protection.

5.4.1 General: Dining Facility shall conform with section 01010, subsection 8, Fire Protection, and the following.

5.4.2 Special Life Safety requirements: None.

5.4.3 Special Fire Sprinkler Requirements: All kitchen range exhaust hoods shall be provided with wet-chemical fire suppression system and connected to the fire alarm system, NFPA 96.

5.4.4 Special Fire Alarm Requirements: None.

6. SOLDIER COMMUNITY BUILDING FUNCTIONS.

6.1. Soldier Community Building (SCB). The traditional Soldier Community Building functions are social gathering areas, recreational space, a meeting place, laundry facilities, mail boxes, kitchen, bulk storage, and a SCB office. These areas provides a place for relaxation and social interaction in an informal setting. This project will not provide bulk storage and a SCB office.

6.2. Design Requirements.

6.2.1. SCB Social Activity area will be located adjacent to the dining facility and the mail boxes on the first floor of Building 650. The area consists of a Lobby and Lounge. The open lobby area will provide seating/gathering areas for soldier interaction and entertainment of visitors. The TV lounge, public toilets, vending machines, and pay phones are also located in this area. Lounge area will be provided with carpeted floors, with an option of quarry tile or VCT, and painted gypsum wallboard or vinyl wall covering walls, or acoustical wall covering, or a combination of wall finishes. Public restrooms will be provided with tile floors and ceramic wall tiles.

6.2.2. Laundry. Laundry rooms will be provided in the service area of each floor of Buildings 651 and 652. The laundry room will be designed to serve a minimum of 50 soldiers per floor. The minimum criteria for providing washers and dryers is one washer per 15 soldiers and one dryer per 10 soldiers. The dryers are doubled stacked for maximum space utilization. The appliances shall meet Energy Star requirements. Also provided are tables for folding of clothes, laundry sinks, and floor drains and utility connections for the washers and dryers.

6.2.2.1. Ceramic or quarry tile floors and painted walls will be provided.

6.2.3. Mail Room and Mail Boxes will be located on the first floor of Building 650. A mail room will be provided for mail distribution by mailboxes. The mailroom will be secured and physically separated from the other rooms in Building 650. Individual recessed apartment type mailboxes will be provided for 600 soldiers.

6.2.3.1. Mailboxes shall be United States Postal Service (USPS) approved rear-loading horizontal type mailboxes. Mailboxes, materials, sizes, construction, and installation shall comply USPS Publication 17, except that the mailboxes shall be provided with combination locks, in lieu of key locks and shall be nine units high. Rear loading type horizontal mailboxes shall be equipped with sheet aluminum removable rear covers strengthened with formed sheet stiffeners. Framework supporting compartment doors shall be fabricated from high strength extruded aluminum alloy. Each compartment door shall have numbers permanently engraved in face of door. Numbering to be vertically, in sequence, from left to right. Numbering of mailboxes shall be coordinated with the contracting officer.

6.2.3.2. Ceramic or quarry tile, carpet, or concrete floors and painted walls will be provided.

6.2.6. Antiterrorism/Force Protection (AT/FP) and Seismic Evaluation and Rehabilitation. Designs shall incorporate minimum AT/FP construction standards and required seismic rehabilitation techniques. See Subsection 4, Section 01010, GENERAL DESIGN - STRUCTURAL, for information on AT/FP and seismic requirements, and instructions on incorporating retrofits and rehabilitation measures in the proposal. See also Subsection 2, CIVIL DESIGN, for site upgrades required for AT/FP.

6.3. Fire Protection. Provide sprinkler protection throughout the building and a fire alarm system in accordance with section 01010, subsection 8, Fire Protection.

6.3.1. General: Soldier Community functions shall conform with section 01010, subsection 8, Fire Protection and the following.

6.3.2. Special Life Safety requirements: None.

6.3.3. Special Fire Sprinkler Requirements: None.

6.3.4. Special Fire Alarm Requirements: None.

7. MISCELLANEOUS REQUIREMENTS

7.1. Covered Gear Wash/Recreational Area.

The standard design package for Large Company Operations Facilities (COF), which includes functional area requirements for a gear wash area should be used to develop the gear wash area requirements. This facility will also be designed for joint usage as a covered recreational area for social gatherings. The recreational area shall be sized to include picnic table seating for 50 to 60 people, 2 built-in barbeque pits, 1-sink, lighting and electrical outlets.

7.2. Multi-Purpose Playing Court.

Multipurpose court shall consist of two (2) basketball courts with two (2) volley ball courts superimposed on each basketball court or a total of four (4) volleyball courts. The courts shall include basketball backboards with nets and removal volleyball posts with flush mounted deck plates to allow unobstructed use of other courts. Contractor shall furnish volleyball posts and nets. Basketball goal height and court markings shall meet National Collegiate Athletic Association (NCAA) standards. Volleyball court markings, netting, and post shall meet United States Volleyball Association (USVBA) standards.

7.2. Bicycle Racks.

The project includes constructing two (2) bicycle racks. Each bicycle rack shall consist of a concrete pad and permanently install racks. The racks shall be sized to accommodate a minimum of 20 adult sized bicycles. The racks shall be designed to permit locking of individual bicycles. Rack material shall be constructed of a durable material (20-year warranty minimum life) compatible to the local climate. The racks shall also include a concrete ramp to permit safe egress to and from the racks.

7.3. Fire Protection.

7.3.1. General:

7.3.2. Special Life Safety requirements: None.

7.3.3. Special Fire Sprinkler Requirements: None.

7.3.4. Special Fire Alarm Requirements: None.

DESIGN AFTER AWARD

1. General

The Contractor shall schedule the number and composition of the design submittal phases. Design submittals are required at the preliminary (50%) and final (95%) design stages and at the design complete stage. The requirements of each design stage are listed hereinafter. The Contractor shall reflect the number and contents of the design submittals phases in the progress charts. As a maximum, the 50%, 95% and 100% complete design submittals shall be made in only one package for each of the fifteen (15) major categories listed in Paragraph, "Contents of Design Submittals," except the foundation design, utilities under the slab (all utilities together as one submittal), the Building Interior Design, and long lead item submittals. These exceptions may be in addition to the 15 major submittals. More than one category may be combined in a submittal.

2. Designer Of Record

The Contractor shall identify, for approval, the Designer of Record for each area of work. One Designer of Record may be responsible for more than one area. All areas of design disciplines shall be accounted for by a listed, registered Designer of Record. The Designer(s) of Record shall stamp, sign, and date all design drawings under their responsible discipline at each design submittal stage (see SCR -"Registration of Designers").

3. Stages Of Design Submittals

3.1. Preliminary Conformance Review Submittal (50%). The review of this submittal is primarily to insure that the contract documents and design analysis are proceeding in a timely manner and that the design criteria is being correctly interpreted. The submittal shall consist of the following:

1. Design analysis, developed to 50%
2. 50% complete drawings
3. Outline Specifications

Environmental permits, as required. When environmental permits are not required, the Contractor shall provide a statement with justification to that effect.

3.2. Final Design Review Submittal (95%). The review of this submittal is to insure that the design is in accordance with directions provided the Contractor during the design process. The Contractor shall submit the following documents for Final Design Review:

1. Design analysis, developed to 95%
2. 95% complete drawings
3. Draft specifications
4. Annotated 50% review comments

3.2.1. The Design Analysis submitted for Final Design Review shall be in its final form. The Design Analysis shall include all backup material previously submitted and revised as necessary. All design calculations shall be included. The Design Analysis shall contain all explanatory material giving the design rationale for any design decisions which would not be obvious to an engineer reviewing the Final Drawings and Specifications.

3.2.2.The Contract Drawings submitted for Final Design Review shall include the drawings previously submitted which have been revised and completed as necessary. The Contractor is expected to have completed all of his coordination checks and have the drawings in a design complete condition. The drawings shall be complete at this time including the incorporation of any design review comments generated by the Preliminary design review. The drawings shall contain all the details necessary to assure a clear understanding of the work throughout construction. Shop drawings will not be considered as design drawings. All design shall be shown on design drawings prior to submittal of shop drawings.

3.2.3. The Draft Specifications on all items of work submitted for Final Design Review shall consist of legible marked-up specification sections.

3.2.4 The Contractor may begin construction on portions of the work for which the Government has reviewed the Final Design Submission and has determined satisfactory for purposes of beginning construction. The ACO or COR will notify the Contractor when the design is cleared for construction. The Government will not grant any time extension for any design resubmittal required when, in the opinion of the ACO or COR, any submission failed to meet the minimum quality requirements as set forth in the Contract.

3.3. Design Complete Submittal (100%). The Contractor shall revise the Contract Documents by incorporating any comments generated during the Final Design Review and shall prepare final hard copy Contract Specifications. The Contractor shall submit the following documents for the Design Complete Submittal:

1. Design analysis, in final 100% complete form
2. 100% complete drawings
3. Final specifications
4. Annotated 95% review comments

3.3.1. The Contractor shall submit the Design Complete Submittal not later than 30 calendar days after the Government returns the annotated Final Conformance Review Submittal.

3.3.2. If the Government allows the Contractor to proceed with limited construction based on pending minor revisions to the reviewed Final Design submission, no payment will be made for any in-place construction related to the pending revisions until they are completed, resubmitted with the Design Complete Submittal and are satisfactory to the Government.

4. Quantity Of Design Submittals

4.1 General. The documents which the Contractor shall submit to the Government for each submittal are listed and generally described hereinafter. Unless otherwise indicated, the Contractor shall submit twenty (20) copies of each item required to be submitted at the Preliminary and Final Conformance Review Submittal stages except the Building Interior Design. The quantities of this item are indicated with the description of the item. All drawings for review submittals shall be half-size blue lines. At the Design Complete Submittal, the Contractor shall also submit five (5) complete full size sets of drawings, five (5) complete half size sets and two copies of CADD files in MicroStation 95 or later format.

5. Mailing Of Design Submittals

5.1. Mail all design submittals to the Government during design and construction, using an overnight mailing service. The Government will furnish the Contractor addresses where each copy shall be mailed to after award of the contract. The submittals shall be mailed to four (4) different addresses.

5.2 Each design submittal shall have a transmittal letter accompanying it indicating the date, design percentage, type of submittal, list of items submitted, transmittal number and point of contact with telephone number.

6. Coordination

6.1. Written Records. Prepare a written record of each design site visit, meeting, or conference, either telephonic or personal, and furnish within five (5) working days copies to the Contracting Officer and all parties involved. The written record shall include subject, names of participants, outline of discussion, and recommendation or conclusions. Number each written record for the particular project under design in consecutive order.

6.2. Design Needs List. Throughout the life of his contract the Contractor shall furnish the COR a biweekly “needs” list for design related items. This list shall itemize in an orderly fashion design data required by the Contractor to advance the design in a timely manner. Each list shall include a sequence number, description of action item, name of the individual or agency responsible for satisfying the action

item and remarks. The list will be maintained on a continuous basis with satisfied action items checked off and new action items added as required. Once a request for information is initiated, that item shall remain on the list until the requested information has been furnished or otherwise resolved. Copies of the list will be mailed to both the Administrative Contracting Officer and the agencies tasked with supplying the information.

7. Government Review Comments

7.1 Within 21 days after Notice to Proceed, the Contractor shall submit, for approval, a complete design schedule with all submittals and review times indicated in calendar dates. The Contractor shall update this schedule monthly.

7.2 After receipt, the Government will be allowed fourteen (14) days to review and comment on each 50% design submittal and twenty-one (21) days to review and comment on each 95% design submittal, except as noted below. For each design review submittal, the COR will furnish the Contractor comments from the various design sections and from other concerned agencies involved in the review process. The review will be for conformance with the technical requirements of the solicitation and the Successful Offeror's (Contractor's) RFP proposal. If the Contractor disagrees technically with any comment or comments and does not intend to comply with the comment, he must clearly outline, with ample justification, the reasons for noncompliance within five (5) days after receipt of these comments in order that the comment can be resolved. The Contractor shall furnish disposition of all comments, in writing, with the next scheduled submittal. The Contractor is cautioned in that if he believes the action required by any comment exceeds the requirements of this contract, that he should take no action and notify the COR in writing immediately. Review conferences will be held for each design submittal at Honolulu Engineer District, Bldg. 230, Fort Shafter. The Contractor shall bring the personnel that developed the design submittal to the review conference. These conferences will take place the week after the twenty-one (21) day review period.

7.3. If a design submittal is over one (1) day late in accordance with the latest design schedule, the Government review period will be extended 7 days. The review conference will be held the week after the review new period. Submittals date revisions must be made in writing at least one (1) week prior to the effect submittal.

8. Design Analysis

8.1. Media and Format. Present the design analysis on 8-1/2-inch by 11-inch paper except that larger sheets may be used when required for graphs or other special calculation forms. All sheets shall be in reproducible form. The material may be typewritten, hand-lettered, handwritten, or a combination thereof, provided it is legible. Side margins shall be 1-inch minimum to permit side binding and head to head printing. Bottom margins shall be 1-1/4-inches, with page numbers centered 1 inch from the bottom.

8.2. Organization. Assign the several parts and sheets of the design analysis a sequential binding number and bind them under a cover indicating the name of the facility and project number, if applicable. The title page shall carry the designation of the submittal being made. The complete design analysis presented for final review with the final drawings and specifications shall carry the designation "FINAL DESIGN ANALYSIS" on the title page.

8.3. Design Calculations. Design calculations are a part of the design analysis. When they are voluminous, bind them separately from the narrative part of the design analysis. Present the design calculations in a clean and legible form incorporating a title page and index for each volume. Furnish a table of contents, which shall be an index of the indices, when there is more than one volume. Identify the source of loading conditions, supplementary sketches, graphs, formulae, and references. Explain all assumptions and conclusions. Calculation sheets shall carry the names or initials of the computer and the checker and the dates of calculations and checking. No portion of the calculations shall be computed and checked by the same person.

8.4. Automatic Data Processing Systems (ADPS). When ADPS are used to perform design calculations, the design analysis shall include descriptions of the computer programs used and copies of the ADPS input data and output summaries. When the computer output is large, it may be divided into volumes at logical division points. Precede each set of computer printouts by an index and by a description of the computation performed. If several sets of computations are submitted, they shall be accompanied by a general table of contents in addition to the individual indices. Preparation of the description which must accompany each set of ADPS printouts shall include the following:

1. Explain the design method, including assumptions, theories, and formulae.
2. Include applicable diagrams, adequately identified.
3. State exactly the computation performed by the computer.
4. Provide all necessary explanations of the computer printout format, symbols, and abbreviations.
5. Use adequate and consistent notation.
6. Provide sufficient information to permit manual checks of the results.

9. Drawings.

9.1. Prepare all drawings on Computer-Aided Design and Drafting (CADD) so that they are well-arranged and placed for ready reference and so that they present complete information. The Contractor shall prepare the drawings with the expectation that the Corps of Engineers, in the role of supervision, will be able to construct the facility without any additional assistance from the Contractor. Drawings shall be complete, unnecessary work such as duplicate views, notes and lettering, and repetition of details shall not be permitted. Do not show standard details not applicable to the project, and minimize unnecessary wasted space. Do not include details of standard products or items which are adequately covered by specifications on the drawings. Detail the drawings such that conformance with the RFP can be checked and to the extent that shop drawings can be checked. Do not use shop drawings as design drawings. The design documents shall consist of drawings on a 30” x 42” format. The Contractor shall use standard Corps of Engineers title blocks and borders on all drawings. Submit an index of drawings with each submittal. The COR will furnish the Contractor file, drawing and specification numbers and CADD file names for inclusion in the title blocks of the drawings.

9.2. Create all drawings using CADD methods in MicroStation format. Save all Design Complete CADD files as MicroStation 95 or later version. The Contractor shall use EM 1110-1-1807 Standards Manual for U.S. Army Corps of Engineers Computer-Aided Design and Drafting (CADD) Systems as guidance to for standard details, cell libraries, title blocks, and layer/level assignments. Drawing features not addressed in EM 1110-1-1807 shall conform to drafting standards.

9.3. When a project is started the designer must use the Honolulu Engineer District Project CADD sheet numbering convention. The sheet reference number is an 8-character alpha numeric system:

1st Character:	Fiscal Year of project.
2nd & 3rd Character:	Location Code (SB = Schofield Barracks).
4th & 5th Character:	Project Numeric Sequence (use 12 for this project)
6th Character:	Drawing Discipline Code (A = Arch; C = Civil; E = Elec; M = Mech; P = Landscaping; S = Struc; F = Fire Spklr; L = Life Safety; R = Fire Alarm)
7th & 8th Character:	Sheet Number (two-character value; 01, 02, 03…)

9.4. The CADD alpha-numeric file number for this project is: 1SB12X01. Where “X” is the drawing discipline code and “01” is the first sheet of that discipline section. This shall insure proper naming of files and tracking of the project within the Honolulu Engineer District.

9.5. Fonts, title blocks, cell libraries, and details required by the Honolulu Engineer District are available. Please call Mr. Howard Murakami (808) 438- 8512.

9.6. Submit all Design Complete CADD files on a CD-ROM disk.

9.7. The building drawings shall consist of 1/16" scale minimum floor plans to accommodate the entire floor plan on one sheet. Detail floor plan drawings shall consist of ¼" scale minimum. All details shall be minimum ¼" scale. Draw building elevations to a 1/16" scale to fit the entire building on one sheet, and other visual information as required. Draw building wall sections at a minimum of 3/8" scale. Equivalent metric scale is acceptable. All drawings shall be either drawn to English scale or Imperial scale

9.8. Use appropriate scale for the site and exterior utility drawings, unless otherwise indicated. Use one drawing sheet for the overall site plan for this project.

10. Specifications.

10.1 The Contractor shall submit outline, marked-up and final specifications as required. The Contractor shall prepare specifications based upon the project requirements as described in this RFP. The Contractor may utilize the unedited Unified Facilities Guide Specifications (UFGS), Army Edition to develop/describe additional project requirements not covered by this RFP. Specification paragraphs and subparagraphs shall not be rewritten to lessen the quality of the original technical specification sections. Designer notes in the UFGS shall not appear in the design submittal. Only bracketed choices and inapplicable items shall be deleted. The Contractor shall complete the editing of all options in these specifications. Where designer notes are provided, the Contractor shall edit the choice in accordance with the recommendations and guidance of the Notes. The Contractor may use catalog cuts of specific equipment within the specifications to describe equipment that is to be provided, thus skipping the requirement for shop drawing or manufacturer's literature during construction.10.1.1 Submittal Register. Develop the submittal requirements during construction during the design phase of the contract, by producing a Contractor Submittal Register during design. Attach a submittal register to each section of the specifications for the submittal requirements of that section. Prepare the Submittal Register on ENG Form 4288. The Contractor shall be responsible for listing all required submittals necessary to insure the project requirements are complied with. The Register shall identify submittal items such as shop drawings, manufacturer's literature, certificates of compliance, material samples, guarantees, test results, etc that the Contractor shall submit for review and/or approval action during the life of the construction contract. The Contractor shall place all the Submittal Register pages in an appendix of the final specifications.

10.2 Editing Specifications (UFGS).

10.2.1 Additions. If the specifications of the UFGS does not cover a feature that is in the project, new sentences and/or paragraphs shall be inserted in the proper locations to adequately cover the feature of work. Additions shall not lesson the quality of materials indicated by the specifications. If a new material is added, it shall be properly referenced in "APPLICABLE PUBLICATIONS," "MATERIALS," "SUBMITTALS," "TESTS," and "INSTALLATION" paragraphs, as applicable.

10.2.2 Deletions. The Contractor shall delete inapplicable text material, as necessary, to tailor the specifications to fit the project. After deletions have been made to all inapplicable paragraphs, subparagraphs, choices, and schedules from the body of the specifications (including but not limited to the correction of lists in "Submittals," "Tests," and "Installation" paragraphs), delete all nonapplicable references listed in the preceding "APPLICABLE PUBLICATIONS" and "MATERIALS" paragraphs.

10.2.3 Code Markings. The Contractor shall not remove any special code markings for submittals, references, tests or section references, unless the text is not required.

10.2.4 References to Specification Sections. The Contractor shall be responsible for coordinating references, along with the technical requirements, to specific specification sections (number and title) within the project specifications. Section references (title and number) shall be revised to reflect the titles and numbers of specification sections used.

10.2.5 Submittals. Each section of the specifications includes a submittal paragraph which lists all applicable Contractor submittals for review and approval by the Contractor's designer and for "For Approval" or "For Information Only" by Construction field offices. Submittals shall be properly marked as

outlined in the Specintact documentation. These codings are used for automatic generation of the Submittal Register in the Specsintact Software. These codings must NOT be deleted from the text. The Submittal Item text between the coding shall be identical (word for word, including punctuation and spacing) to the paragraph text in the reference paragraph(s). Text may be either upper or lower case letters.

10.3 Format for Project Specifications. The Contractor shall submit the project specification, including a Cover page and Table of Contents, printed with a word processor (Using SpecsIntact software) using good quality white paper. The corrected 100 percent specifications with incorporated review comments shall be submitted in both hard copy and on magnetic media (A DOS compatible 1.44 MB floppy disk and CD-ROM and compatible with the "Specsintact" micro computer software package. Format shall be as outlined in the Specsintact documentation. The Cover page shall be similar to the RFP Cover page and shall include:

- Project title, activity and location.
- Document Description
- Stage of Design
- Construction contract number.
- Construction contractor's name and address.
- Design firm's name and address.
- Names of design team members (Designers of record) responsible for each Contractor prepared technical discipline of the project specification.
- Name and signature of a Principal of the design firm.

10.4 Construction Submittals. Construction submittal types and products, including the submittal description numbers and data package numbers, shall be included in the specification sections, where required. When appropriate, the Contractor shall use specific product terms instead of the generic product terms contained in the specifications sections (e.g., asphalt shingles, built-up roofing, EPDM single ply, etc. vs roof covering; concrete masonry units, brick, metal siding, etc. vs exterior skin; mineral fiber board, block, batt or blanket, polystyrene, polyurethane, polyisocyanurate board vs insulation)

10.4.1 Submittals Register. The Contractor shall prepare and maintain a Submittals Register. The Submittal Register (ENG Form 4288" Submittal Register") shall be prepared using SpecsIntact Software.

11. Surveying And Mapping.

11.1 General: The Government will provide topographic survey and existing utility information o/a end of May 2001. Additional topographic information required for design after award shall be procured and paid for by the Contractor.

12. Contents Of 50% Design Submittals.
The 50% design submittals shall contain as a minimum, the following:

12.1. Paving, Grading and Drainage

12.1.1. Explanation of objectives and factors influencing siting decisions.
General overview of major site features planned, such as building orientation, drainage patterns, parking provisions, traffic circulation, provisions for the handicapped, security requirements, etc. Rationale for locating major site elements. Set back requirements or specific clearance requirements. Locations of borrow and spoil areas.

12.1.2. Requirements for flood protection. Selected storm drainage plan with respect to existing storm drainage system. Alternate schemes considered in arriving at selected plan. Disposition of storm water collected in the new system. Planned connections to the existing storm drainage system. Handling of roof runoff. Features and locations of special drainage structures. Types of materials to be specified for each installation. Selected design values to be used in the storm drainage calculations such as surface runoff coefficient, retardance coefficient, infiltration rate, and rainfall intensity based on a 10-year storm

frequency. Design flood frequency and minimum elevation to provide flood protection. Planned finished floor elevations.

12.1.3. Slope stability analysis (cut and fill) and justification for any slopes steeper than 3:1 for cohesive soils and 4:1 for cohesionless soils.

12.1.4. Pavement design analysis shall include design method and all pertinent data including traffic types, volumes, soils data and any other data used to design the pavement structures. Flexible Pavements--required thickness of base and pavement based on the pavement design and established subgrade CBR. Rigid Pavements--required thickness of nonreinforced concrete pavement and the established modulus of subgrade reaction.

12.1.5. Traffic volume and type. Particular AASHTO design vehicles for which turning movements are to be provided for and corresponding minimum turning radius.

12.1.6. Requirements for curbs, sidewalks, guardrails, traffic signs, markings, fencing, etc. Intersections or connections to existing roads and streets. Traffic routing during construction.

12.1.7. Site plan (geometry) and grading and drainage plan.

12.1.8. An overall site plan on one drawing showing all paving, grading and drainage.

12.1.9. Permit applications.

12.2. Geotechnical.
A geotechnical report and design analysis.

12.3. Water Supply and Sanitary Sewage.

12.3.1. Design narrative and design calculations for the water supply and wastewater systems relating to this project. Include an analysis of the existing water distribution system capability to supply sufficient quantity at adequate pressures for fire protection. If the existing water distribution system is inadequate, provide the design solution to augment the water supply to meet the fire protection requirements. Design for wastewater systems shall show sewage flows, pipe sizes, routing, elevations, pump type and capacities, wet well sizing, etc. The Contractor shall present an analysis presenting proposed corrections of deficiencies or confirming the adequacy of the existing water supply system to support the proposed building.

12.3.2. Drawings developed to the point of showing in plan the anticipated systems and layout. Rough details of pumping systems or other features requiring detail drawings.

12.3.3. Anticipated permit requirements for water and wastewater features.

12.3.4 Lawn and Landscaping Irrigation System.
The design submittal shall include drawings clearly showing the piping layout and location of sprinkler heads coordinated with the landscaping plan, control valves, backflow preventers, rain check switches, controllers, etc. Indicate buildings, walks, shrubbery, trees, and other obstacles that might interfere with the proper operation of the sprinkler system. A design analysis calculating the pressures at each sprinkler head for the capacity and radius of throw is required. Details of the sprinkler head installation, valve boxes, and other irrigation appurtenances shall be submitted.

12.4. Landscape, Planting and Turfing.

12.4.1. The landscape planting design narrative shall describe the analysis of existing site conditions, including an indication of existing plant materials that are to remain on the site. The statement of concept shall indicate specific site problems related to proposed development and the rationale for proposed plant

locations. The narrative shall also include a list of suggested types and sizes of plant materials which are to be used, based upon the designated functional and visual criteria.

12.4.2. The concept drawings shall be prepared at a scale which corresponds with the site layout and grading plans and, likewise, shall include reference coordinates, north arrows, graphic scales and appropriate legends. An overall planting layout shall be developed and shall include enlarged detail plans of specific areas, as needed, to clarify requirements. The proposed layout shall indicate shade trees, evergreen trees, flowering trees, shrub masses, etc., according to designated functional and visual locations of planting. A legend which also indicates sizes of plants recommended for each of the above categories shall be included. The drawings and all subsequent plans shall indicate existing and proposed buildings, paved areas, signs, light standards, transformers, dumpster areas, storm drainage system, and other structures and utilities.

12.5. Architectural

12.5.1. Design narrative shall provide a summary of functional space relationships, as well as circulation. There shall also be a general statement for the rationale behind the major design decisions.

12.5.2. Plans shall indicate dimensions, columns lines, and detail references. Toilets and other specialized areas shall be drawn to ¼" scale and shall show any needed interior features.

12.5.3. Finish schedule shall indicate material, finishes, colors and any special interior design features such as soffits, fascias, and lighting troughs, etc.

12.5.4. All required equipment shall be shown on the drawings with an equipment list.

12.5.5. List any special graphics requirements that will be provided.

12.5.6. Schedules shall be provided for both doors and windows. These schedules shall indicate sizes, types, and details for all items shown on floor plans.

12.5.7. Hardware sets using BHMA designations.

12.5.8. Composite floor plan showing all prewired workstations or kitchen equipment. Also show typical elevations of each type of workstation or equipment.

12.5.9. Building Interior Design (BID) package.

12.6. Structural Design.

12.6.1. State the live loads to be used for design. Include roof and floor loads; wind loads, lateral earth pressure loads, seismic loads, etc., as applicable.

12.6.2. Describe the method of providing lateral stability for the structural system to meet seismic and wind load requirements. Include sufficient calculations to verify the adequacy of the method.

12.6.3. Furnish calculations for all principal roof, floor, and foundation members.

12.6.4. This submittal shall include drawings showing roof and floor framing plans as applicable. Principal members will be shown on the plans. A foundation plan shall also be furnished showing main footings and grade beams where applicable. Where beam, column, and footing schedules are used, show schedules and fill in sufficient items to indicate method to be used. Typical sections shall be furnished for roof, floor, and foundation conditions. Structural drawings for proposals and submittals shall be separate from architectural drawings.

12.6.5. Provide any computer analyses used shall be widely accepted, commercially available programs or complete documentation.

12.6.6. Antiterrorism/Force Protection (AT/FP) and Seismic Evaluation and Rehabilitation. The design analysis provided in the proposal submission shall be further developed. Complete the Government-furnished designs on AT/FP and seismic hazards mitigation, and provide detailed drawings reflecting the completed designs. Designs shall be stamped by a structural engineer licensed in the U.S.

12.6.7. A narrative description and supporting calculations shall show structural adequacy of existing structure to support new live loads. If existing floor systems will require strengthening to maintain structural integrity, provide an analysis and complete and detailed drawings showing the work.

12.7. Plumbing.

12.7.1. List all references used in the design including Government design documents and industry standards.

12.7.2. Provide justification and brief description of the types of plumbing fixtures, piping materials and equipment proposed for use.

12.7.3. Prepare detail calculations for systems such as sizing of domestic hot water heater (follow ETL 1110-3-489 titled "*Domestic Water Heaters for Barracks*" for the barracks application) and piping; other domestic water piping; container gas piping and tanks (if applicable), grease separator (follow City and County of Honolulu standards); steam service for kitchen; DWV systems.

12.7.4. Indicate locations and general arrangement of plumbing fixtures and major equipment.

12.7.5. Include plan and isometric riser diagrams of all areas including hot water, cold water, waste and vent piping. Piping layouts and risers should also include LP gas (if applicable), and other specialty systems as applicable.

12.7.6. Include equipment and fixture schedules with descriptions, capacities, locations, connection sizes and other information as required.

12.8. Fire Protection. Abbreviations used are defined in **GENERAL PROJECT DESCRIPTION AND GENERAL DESIGN REQUIREMENTS, FIRE PROTECTION.**

12.8.1. Fire Protection Analysis is required to be submitted in accordance with 1008C. Requirement must be stated with what is being provided in the project to meet this requirement. Include proposal submittal and the following: Hydraulic analysis and node sketch for all sprinkler systems to be installed in all buildings in accordance with FSC. Calculations confirming the adequacy of the existing water supply shall be provided. Hydrant flow data to be submitted. Locations of all fire pumps/tanks shall be shown. All UBC allowable area, allowable height, construction type to be used and location on property requirements shall be shown. Fire alarm system type (addressable) to be submitted with listed manufacturer and model catalog cuts of all fire alarm system equipment. Discussion of the life safety requirements of LSC.

12.8.2. Fire Protection Drawings: Plan drawings and at least one building section minimum for each building showing the fire alarm systems, sprinkler system and life safety requirements (fire barriers, exits, etc.).

12.8.2.1. The minimum drawings for the fire alarm system shall show location of the fire alarm panel, fire alarm annunciator, fire alarm transmitter, main conduit runs. Include location of most initiation device and indicating appliance locations.

12.8.2.2. The minimum drawings for the sprinkler system shall show sprinkler riser locations, fire department connection locations, local alarm gong locations, sprinkler design parameters (occupancy

hazard for each room, minimum sprinkler density to be used for each occupancy hazard, minimum design area, most hydraulically remote area, sprinklered areas). Include sprinkler piping layout with nodes required by FSC for hydraulic analysis submittal to include the most hydraulically remote area. Fire pump and tank locations with general piping layout.

12.8.2.3 Minimum drawings for the life safety requirements shall show where the fire barriers begin and end, exit locations, common path, travel distance, dead end, stair enclosure requirements, exit access corridor/width, occupancy by room or area, hazardous rooms, location of enclosed vertical openings. Location of fire rated walls, fire rated shafts, exits, corridors, hazardous rooms, special LSC requirements.

12.8.3. Fire Protection Specifications: Submit list of specification sections to be used.

12.9. Heating, Ventilating and Air Conditioning (HVAC).

12.9.1. Final energy analysis and calculated energy budget.

12.9.2. Design analysis including 50% design calculations.

12.9.3. Preliminary temperature control drawings and sequence of operation.

12.9.4. Preliminary EMCS design drawings and interface drawings showing connections to existing CCMS system.

12.9.5. HVAC system drawings for 50% design (single line format is acceptable).

12.10. Mechanical Specialties

12.10.1. Elevators

12.10.1.1. A list of criteria codes, documents and design conditions used. Reference to any authorized waiver of these criteria or codes.

12.10.1.2. A description of the proposed control system.

12.10.1.3. Description, approximate capacity and location of any elevator equipment.

12.10.2. Kitchen Equipment

12.10.2.1. Description, approximate capacity and location of any kitchen equipment.

12.11. Interior Electrical System

12.11.1. In a narrative, indicate electrical characteristics (phase, voltage, and number of wires) for the electrical system. Provide a justification for the system chosen (economic or special condition). A life cycle analysis is required on 208Y/120 Volt systems 300 kVA and above.

12.11.2. Provide a description of the lighting system(s) to be used for all areas, referencing calculations.

12.11.3. Also include a tabulation showing the following:
- Room name and number.
- Lighting intensity for each room. (State the basis for selection such as I.E.S., etc.).
- Identify the type of fixture by manufacturers catalog cut.
- State the type of wiring system to be used, such as insulated conductors installed in rigid or intermediate metal conduit, insulated conductors installed in electrical metallic tubing, nonmetallic sheathed cables, etc.

- Provide a paragraph describing any special design items such as handicapped and seismic design requirements, power filters, emergency power system, UPS, etc.
- Define any hazardous classified locations by class, division, and group as defined by the National Electrical Code. Indicate the types of equipment to be used in these areas. State the reasons for the area(s) being hazardous classified locations.
- Describe the lightning protection system to be installed. This should also include the type of grounding system planned and shown.
- Describe the basic characteristics of panelboards, switchgear, switchboards, motor control centers, transfer switches, UPS, and other major pieces of electrical equipment being provided. Short circuit and voltage drop calculations showing these values at all equipment with protective devices included shall be provided. Indicate equipment interrupting ratings and short circuit withstand ratings based on these calculations.
- Describe the electrical metering equipment to be provided.
- Provide a statement that no duct or liquid piping shall pass over and/or through any electrical space and/or room as defined by the National Electrical Code Article 384.

12.11.4. The power riser or one-line diagram shall be essentially complete except for finalization of conduit and wire sizes.

12.11.5. Panelboards, switchboards, switchgear, motor control centers, and all other utilization equipment shall be located on the floor plans. Schedules for applicable equipment shall be provided. The schedules shall include all pertinent information to fully describe the equipment. Elevations for free standing equipment shall be provided but need not be entirely finalized.

12.11.6. Details of the layouts for electrical closets and rooms shall be shown.

12.11.7. Receptacles and lighting layouts (with wiring completed) shall be shown for typical rooms. Typical rooms are those which appear more than one time (sizes are the same) or those of the same function with different sizes.

12.11.8. Areas where nonlinear loads will be encountered shall be identified. Per the requirements of paragraphs 4c and 4g of ETL 1110-3-403, the use of 75 degree C. (minimum) conductors is required. Branch circuits serving eight-wire systems furniture or groups of nonlinear loads shall be 3#12, 1#10 N., 1#12 GND. and 1#12 Isolated GND. Feeders serving panelboards with nonlinear loads shall have the neutral conductor ampacity based on at least 1.73 times the ampacity of the phase conductors. The neutral bus in the panelboards shall have the same criteria. The simplest way to accomplish the upsizing of the neutral conductor is to provide double ampacity neutrals or parallel conductors in sizes permitted by the National Electrical Code.

12.11.9. A completed fixture schedule shall be included on the drawings.

12.11.10. All removals shall be shown on demolition plans.

12.12. Exterior Electrical Distribution System

12.12.1. In a narrative, clearly describe the electrical distribution system and state the changes to be made to the existing system to accommodate this project. State any deficiencies to be corrected and provide a description of all new work being performed.

12.12.2. State the electrical characteristics of the power supply from the service point to the main service equipment.

12.12.3. Indicate the type, number, voltage rating and connections, and kVA rating of all transformers provided.

12.12.4. State the type of conductor to be used and provide a justification for its use.

12.12.5. Include a statement describing the criteria used for the exterior design such as primary and secondary voltage drop. Describe the physical characteristics of both the underground and overhead power lines. Provide the short circuit current available at the site and state the source of this value.

12.12.6. Include a description of all exterior lighting systems included in the design. Identify the fixture types, poles and design lighting levels. Provide point-to-point calculations showing that all design levels have been achieved.

12.12.7. Describe energy conservation measures and/or techniques that are being incorporated into the design.

12.12.8. All of the exterior electrical design drawings shall be completed with all poles (lighting), underground conductors, manholes, handholes, ductbanks, and all pertinent componentsidentified on the plans. Details shall include but not limited to poles, manholes, handholes, ductbanks, etc. Calculations shall support all new manhole and handhole locations.

12.12.9. All removals shall be shown on demolition plans.

12.13. Electronic Systems responsibilities include the following:

Telecommunication System
Cable Television System
Intrusion Detection

The design analysis shall include all calculations required to support design decisions and estimates at this stage of design. The analysis shall include specific criteria furnished, conference minutes and cost analyses of all systems considered.

12.13.1. Show location of telephone outlets (including pay phones) on the plans. Include legend and symbol definition to indicate height above finished floor. Show a Telecommunication Conduit System Riser Diagram. Provide typical sizes of the conduits on Riser Diagram. It is not required to show conduit runs between backboard and outlets on the floor plans. Underground telephone distribution conduit shall be shown on either the electrical or electronic site plan.

12.13.2. Grounding System. The specifications and drawings shall completely reflect all of the design requirements. The specifications shall require field tests (in the construction phase), witnessed by the Contracting Officer, to determine the effectiveness of the grounding system. The design shall include drawings showing existing construction.
Verification of the validity of any existing drawings and/or any other data furnished by the Government shall be the responsibility of the engineering services firm.

12.13.3. Provide a statement describing the extent of any exterior work such as telecommunication lines, cable television (TV) distribution cables, duct banks, etc., outside of 5 feet from the building line.

12.13.4. Exterior work to be shown on electrical site plan.

- Existing and new telecommunications and cable television service lines, both overhead and underground, shall be properly identified.
- Show removals and relocations, if any.

12.13.5. Provide a descriptive narrative of all electronic systems that are required for this project. Define any hazardous areas (as defined in the National Electric Code) and indicate the type of equipment proposed for use in such areas. Show the location of all electronic system panels, etc., on the floor plans. Show the proposed riser diagrams for all systems. Show sizes of all conduit, wires, cables, panels, etc. Provide a complete symbol legend for all devices or equipment shown on the plans. For work requiring

removals or demolition, the designer shall show by use of drawings or narrative, how demolition work is to be done.

12.14. Submit outline specifications.

12.15. Submit the SPIRIT rating sheet for sustainable design bronze level compliance.

13. Contents Of 95% Design Submittals.
The 95% design submittals shall contain as a minimum, the following:

13.1. A complete set of construction documents plans and specifications at the same level of detail as if the project were to be bid including a complete list of equipment, fixtures and materials to be used. The final drawings are an extension of the reviewed 50% drawings and are to include the 50% comments. The additional 5% is to complete the drawings due to the final design review comments. All details shall be shown on the drawings.

13.2. The design analysis is an extension of the reviewed 50% design analysis and supports and verifies that the design complies with the requirements of the project.

13.3. Submit marked-up specifications. The specifications shall be coordinated with the drawings and describe in detail all items shown on the drawings.
13.4. Water Supply and Sanitary Sewage.
The designer is required to Directorate of Public Works, Engineering Division, Bldg. 113, WAAF to verify the correct procedure to follow to obtain utility excavation permits. The designer shall prepare all permit applications required to a “READY FOR SIGNATURE” condition and forward them to the Contracting Officer for appropriate signatures and submittal to the state. All contacts with Government agencies shall be documented in writing and furnished to the Corps of Engineers at the 95% submittal.

13.5. Landscape, Planting and Turfing.
Final design drawing(s) shall include a complete schedule of plant materials which indicates their botanical and common names, plan symbols, quantities, sizes, condition furnished, and pertinent remarks. Metric scale of drawing shall be prepared at 1:400. Drawing shall correspond with the site layout and grading plans and reference coordinates, north arrows, graphic scales and appropriate legends. An overall planting layout shall be developed and shall include enlarged detail plans of specific areas as needed, to clarify requirements. Final design drawings, indicating proposed plants by a (+) mark for the plant location and a circle which is scaled at approximately 2/3 the ultimate growth spread (diameter) of plants, shall also include a complete schedule of plant materials which indicates botanical and common names, plan symbols, quantities, sizes, condition furnished, and pertinent remarks. Final drawings shall also include the basic details for installation of tree, shrub, and ground cover planting, as well as any other applicable details for clarification of specific project requirements.

13.6. Architectural

13.6.1. All architectural drawings shall be coordinated
with the other engineering disciplines. Ensure that the plans are in compliance with the applicable codes. It will be the Contractor’s responsibility to implement the comments generated from any design review submittal as well as verify the consistency between plans and specification. The evaluation of the Contractor’s submittals shall be based on degree to which the submittal meet the requirements set forth in this document and the specifications.

13.6.2. Prewired workstation composite floor plans.
Prewired workstation typicals - elevations and component inventory. Prewired workstation panel identification plan with electrical outlet placement including base feed.

13.6.3. BID package.

13.7. Structural Design

13.7.1. Furnish complete checked calculations for all structural members. Incorporate any changes required by comments on 50% Design Submittal.

13.7.2. Prior to this submittal, structural drawings shall be coordinated with all other design disciplines.

13.7.3. The final structural drawings shall contain the following information as a set of general notes:
The allowable soil bearing value.
The design stresses of structural materials used.
The design live loads used in the design of various portions of the structures.
The design wind speed.
The seismic spectral accelerations, seismic use group, site class, and the “R” and “T” values used in design.

13.7.4. All structural drawings and calculations shall be checked and stamped by the designer of record (a registered Professional Engineer).

13.8. Fire Protection: Abbreviations used are defined in **GENERAL PROJECT DESCRIPTION AND GENERAL DESIGN REQUIREMENTS, FIRE PROTECTION.**

13.8.1 Fire Protection Design Analysis: Include 50% submittal and the following: Voltage drop calculations and battery capacity required for the fire alarm system panel and transmitter. All shop submittal requirements in the specifications. All detailed life safety requirements of LSC.

13.8.2 Fire Protection Drawings: Include 50% submittal and the following: Detail Plans and building sections; detail fire pump plans, minimum 1:50 scale or english equivalent; isometric diagrams of fire pump system & fire alarm system, Detail drawings of sprinkler riser, sprinkler system supports, sway bracing, branch restraints, pipe/conduit penetrations of fire rated building walls, floors, roof/ceiling. Sprinkler drawings shall be provided in accordance with FSC.

13.8.2.1 Minimum drawing requirements:

13.8.2.1.1 Automatic Fire Sprinkler system: Plans, building sections, sprinkler riser with shutoff valve and tamper switch, alarm check valve with testing trim, retard chamber, alarm gong, and flow/pressure switch, sway bracing, branch restraints, hangers, pipe supports, wall penetrations, fire rated wall penetrations. All requirements in FSC for shop drawing submittal are to be shown on the drawings.

13.8.2.1.2 Fire alarm system: Plans showing location of all initiation devices (manual pull stations, duct smoke detectors, sprinkler flow switches, smoke detectors, magnetic door holders), visible/audible notification appliances, supervisory devices (tamper switches), exit signs, conduit/conductor routing, fire alarm diagram showing point to point conductor connections from the fire alarm panel to all devices and appliances, fire alarm panel, fire alarm transmitter, interface panel and any other requirements in the specifications.

13.8.2.1.3 Life Safety: All fire rated walls shall be shown where they begin and where they end. All fire rated shafts, stairs, vertical openings, seismic joints shall be shown. Fire rated doors, fire rated door frames, fire rated windows and window frames, door hardware and their listed manufacturer details and instructions are to be shown and submitted for approval. All listed manufacturer firestopping details and instructions required for the pipe, conduit and duct penetrations of all fire rated barriers shall be submitted for approval in accordance with UFGS. All listed fire damper manufacturer details and instructions shall be submitted for approval.

13.8.2.1.3.1 UBC requirements: Site plan showing the location of the project buildings in relation to other existing buildings, roads, parking lots, fuel tanks, water tanks, electric poles, exterior power lines.

13.8.2.1.3.2 Fire rated wall, fire rated doors, fire rated windows, firestopping, fire dampers, fire alarm system, exit signs, emergency lighitng must be listed with an independent laboratory such as UL.

13.8.2.1.4 Emergency lighting meeting LSC shall be shown on the plans.

13.8.3 Fire Protection Specifications: Submit “marked up” specification sections.

13.9. Mechanical Systems

13.9.1. HVAC system

13.9..11. Final design analysis of HVAC systems including final load calculations.

13.9.1.2. Final temperature control design drawings.

13.9.1.3. (Not used)

13.9.1.4. Design drawings showing how the new HVAC system is tied into the existing chiller system (chiller, cooling tower, pumps, piping systems). Also detailed design drawings of the new AC system, temperature controls, and building control system.

13.9.2. Elevator system

13.9.2.1 Design drawings of the elevator systems, including seismic restraint drawings and calculations.

13.9.3. Plumbing systems

13.9.3.1 Design drawings of each plumbing system (domestic water, DWV, steam service for kitchen if applicable, and any other plumbing system) including all equipment and fixtures.

13.9.4. Kitchen Equipment

13.9.4.1 Design drawings for all kitchen equipment including locations and stub-outs for all kitchen equipment.

13.10. Interior Electrical System

13.10.1. A coordination study with appropriate curves shall be provided to show that all protective devices have been fully coordinated. Completed short circuit calculations for the. entire electrical system shall also be provided. All equipment shall be identified by manufacturer’s name and catalog number.

13.10.2. Complete voltage drop and lighting calculations shall also be provided. The voltage drop calculations shall use the same single line diagram as the short circuit calculations and shall show drops at the same locations as short circuit currents are shown. Lighting calculations (zonal cavity method for interior and point-to-point for exterior) shall be provided for all rooms and spaces and all exterior locations requiring illumination.

13.10.3. The design narrative shall be an updated version of the 50% submittal but shall reflect the design as submitted. The aforementioned calculations shall be included with the narrative. The calculations and coordination study shall have the seal of the registered engineer who performed the same affixed to the cover sheet.

13.10.4. All details shall be completed at this stage.
Congested areas which cannot be clearly shown at the drawing scale, shall be shown by expanded scale drawings.

13.10.5. The drawings shall be thoroughly checked for discipline conflicts to insure that the proper electrical connections are provided for equipment of other disciplines and that there are no conflicts between the location of electrical equipment and equipment of other disciplines.

13.10.6. The drawings shall also be checked for intradiscipline conflicts.

13.11. Exterior Electrical Distribution System

13.11.1. A coordination study with appropriate curves shall be provided to show that ALL protective. devices have been fully coordinated. Completed short circuit calculations for the entire electrical system shall also be provided. All equipment shall be identified by manufacturer's name and catalog number.

13.11.2. Complete voltage drop and lighting calculations shall also be provided. The voltage drop calculations shall use the same single line diagram as the short circuit calculations and shall show drops at the same locations as short circuit currents are shown. Lighting calculations (zonal cavity method for interior and point-to-point for exterior) shall be provided for all rooms and spaces and all exterior locations requiring illumination.

13.11.3. The design narrative shall be an updated version of the 50% submittal but shall reflect the design as submitted. The aforementioned calculations shall be included with the narrative. The calculations and coordination study shall have the seal of the registered engineer who performed the same affixed to the cover sheet.

13.11.4. The drawings are a completed version of the 50% design drawings with all comments and any other changes incorporated.

13.11.5. All details shall be completed at this stage. Congested areas which cannot be clearly shown at the drawing scale, shall be shown by expanded scale drawings.

13.11.6. The drawings shall be thoroughly checked for discipline conflicts to insure that the proper electrical connections are provided for equipment of other disciplines and that there are no conflicts between the location if electrical equipment and equipment of other disciplines.

13.11.7. The drawings shall also be checked for intradiscipline conflicts..

13.12. Comprehensive Interior Design (CID). The Comprehensive Interior Design is composed of two types of interior design requirements. The first is the building-related interior finishes of walls, ceilings, floor coverings, built-in casework, etc. This is defined as the BID or Building Interior Design. This is the responsibility of the Offeror. The second requirement is the design coordination of interior furnishings and equipment related to the building-related interior finishes. This second requirement is hereinafter referred to as "FID". CID services will be provided by the Offeror.

13.12.1. Definition: The Building Interior Design (BID) shall involve the selection and sampling of all applied finishes including material, color, texture and patterns necessary to complete the building's interior architectural features. The BID shall also include all prewired workstation finishes and required drawings for prewired workstations. This information shall be submitted in 3" D-ring binders, 8-1/2" x 11" format.

13.12.2 Present architectural finish samples in an orderly arrangements according to like rooms/areas receiving like finishes. Each like room receiving like finishes will be noted as a Color Scheme. Each Color Scheme shall have a written description of material used. This written description shall use the same material abbreviations and notes that appear on the Room Finish Schedule and Legend in the contract

drawings. Present prewired workstation finishes on a color board separate from the architectural finishes. Submit the CID binders concurrently with the architectural design submittals.

13.12.3 Preliminary Submittals: The Contractor shall submit three complete sets of the initial CID package. The design philosophy shall use a warm neutral background color with appropriate accent colors. All CID proposals shall be reviewed and approved by the Government. The Interior Designer shall revise the CID binders after each review and update the CID to satisfy review comments. Each submittal will follow this method of review until the Government approves the completed CID package.

13.12.4 Final Submittal: After approval of the Preliminary Submittal, the Contractor shall submit three (3) complete sets of the approved and final Comprehensive Interior Design package. Once the Contractor has submitted the CID and the Government has approved the submittal, all materials, finishes, colors, textures and pattern submitted and approved for this project are then considered as part of the contract and the Contractor shall furnish all approved BID finishes. Deviations will be considered as it relates to the entire package for compatibility. Acceptance of a deviation in material and color may impact another finish. A re-submittal of the entire CID package may be required.

13.12.5. Format: See Attachment.

13.12.6. Signage may include emblems, striping, letters, numbers and logos. The interior designer shall consider visual appearance, organization, location, structural supports (if required) and relation to other base graphics. Indicate on a separate signage sheet the location and message for all signage. Submit a sample of the signage material finish and color with the building interior finishes and a signage plan.

SECTION 01320 ˜PROJECT SCHEDULE˜

1. General

1.1. Submittals
Government approval is required for submittals with a “GA” designation; submittals having an “FIO” designation are for information only. The following shall be submitted in accordance with Section 01330 Submittal Procedures:

SD-07 Schedules
Initial Project Schedule; GA; CD/OD
Preliminary Project Schedule; GA; CD/OD
Periodic Schedule Updates; GA; CD/OD
Three copies of the schedules showing codes, values, categories, numbers, items, etc., as required.

SD-08 Statements
Qualifications; FIO; CD/OD
Documentation showing qualifications of personnel preparing schedule reports.

SD-09 Reports
Narrative Report; FIO; CD/OD
Schedule Reports; FIO; CD/OD
Three copies of the reports showing numbers, descriptions, dates, float, starts, finishes, durations, sequences, etc., as required.

1.2. Qualifications.
The Contractor shall designate an authorized representative who shall be responsible for the preparation of all required project schedule reports. This person shall have previously created and reviewed computerized schedules. Qualifications of this individual shall be submitted to the Contracting Officer’s Representative for review with the Preliminary Project Schedule submission.

2. Products. (Not Applicable)

3. Execution.

3.1. General
Pursuant to the Contract Clause, SCHEDULE FOR CONSTRUCTION CONTRACTS a Project Schedule as described below shall be prepared. The Contractor shall be responsible for scheduling of all design, procurement and construction activities. Contractor management personnel shall actively participate in its development. Designers. subcontractors and suppliers working on the project should also contribute in developing and maintaining an accurate Project Schedule. The approved Project Schedule shall be used to measure the progress of the work, to aid in evaluating time extensions, and to provide the basis of all progress payments.

3.2. Basis for Payment
The schedule shall be the basis for measuring Contractor progress. Lack of an approved schedule or scheduling personnel shall result in an inability of the Contracting Officer’s Representative to evaluate Contractor progress for the purposes of payment. Failure of the Contractor to provide all information, as specified below, shall result in the disapproval of the entire Project Schedule submission and the inability of the Contracting Officer’s Representative to evaluate Contractor progress for payment purposes. In the case where Project Schedule revisions have been directed by the Contracting Officer’s Representative and those revisions have not been included in the Project Schedule, then the Contracting Officer’s Representative may hold retainage up to the maximum allowed by contract, each payment period, until revisions to the Project Schedule have been made.

3.3 PROJECT SCHEDULE

The computer software system utilized by the Contractor to produce the Project Schedule shall be capable of providing all requirements of this specification. Failure of the Contractor to meet the requirements of this specification shall result in the disapproval of the schedule. Manual methods used to produce any required information shall require approval by the Contracting Officer's Representative.

3.3.1. Use of the Critical Path Method.
The Critical Path Method (CPM) of network calculation shall be used to generate the Project Schedule. The Contractor shall provide the Project Schedule in either the Precedence Diagram Method (PDM) or the Arrow Diagram Method (ADM).

3.3.2. Level of Detail Required.
With the exception of the initial and preliminary schedule submission, the Project Schedule shall include an appropriate level of detail. Failure to develop or update the Project Schedule or provide data to the Contracting Officer's Representative at the appropriate level of detail, as specified by the Contracting Officer's Representative, shall result in the disapproval of the schedule. The Contracting Officer's Representative will use, but is not limited to, the following conditions to determine the appropriate level of detail to be used in the Project Schedule.

3.3.2.1. Activity Durations.
Contractor submissions shall be required to follow the direction of the Contracting Officer's Representative regarding reasonable activity durations. Reasonable durations are those that allow the progress of activities to be accurately determined between payment periods. A rule of thumb, that the Contractor should use, is that less than 2 percent of all non-procurement activities' Original Durations shall be greater than 20 days.

3.3.2.2. Design and Permit Activities.
The Contractor shall integrate design and permitting activities, including necessary conferences and follow-up actions and design package submission dates into the schedule.

3.3.2.3. Procurement Activities.
Tasks related to the procurement of long lead materials or equipment shall be included as separate activities in the project schedule. Long lead materials and equipment are those materials that have a procurement cycle of over 90 days. Examples of procurement process activities include, but are not limited to: submittals, approvals, procurement, fabrication, delivery, installation, start-up, and testing.

3.3.2.4. Government Activities.
Government and other agencies activities that could impact progress shall be shown. These activities include, but are not limited to: design reviews, submittal reviews, environmental permit approvals by State regulators, inspections, utility tie-in, Government Furnished Equipment (GFE) and notice to proceed for phasing requirements.

3.3.2.5. Workers Per Day.
All activities shall have an estimate of the average number of workers per day that are expected to be used during the execution of the activity. If no workers are required for an activity, in the case of activities related to procurement, for example, then the activity shall be identified as using zero workers per day. The workers per day information for each activity shall be identified by the Workers Per Day Code.

3.3.2.6. Responsibility.
All activities shall be identified in the project schedule by the party responsible to perform the work. Responsibility includes, but is not limited to, the subcontracting firm, contractor work force, or government agency performing a given task. Activities shall not belong to more than one responsible party. The responsible party for each activity shall be identified by the Responsibility Code.

3.3.2.7. Work Areas.

All activities shall be identified in the project schedule by the work area in which the activity occurs. Activities shall not be allowed to cover more than one work area. The work area of each activity shall be identified by the Work Area Code.

3.3.2.8. Modification or Claim Number.
Any activity that is added or changed by contract modification or used to justify claimed time shall be identified by a mod or claim code that changed the activity. Activities shall not belong to more than one modification or claim item. The modification or claim number of each activity shall be identified by the Mod or Claim Number.

3.3.2.9. Bid Item.
All activities shall be identified in the project schedule by the Bid Item to which the activity belongs. An activity shall not contain work in more than one bid item. The bid item for each appropriate activity shall be identified by the Bid Item Code.

3.3.2.10. Phase of Work.
All activities shall be identified in the project schedule by the phases of work in which the activity occurs. Activities shall not be allowed to contain work in more than one phase of work. The project phase of each activity shall be by the unique Phase of Work Code.

3.3.2.11. Category of Work.
All Activities shall be identified in the project schedule according to the category of work which best describes the activity. Category of work refers, but is not limited to, the procurement chain of activities including such items as submittals, approvals, procurement, fabrication, delivery, installation, start-up, and testing. The category of work for each activity shall be identified by the Category of Work Code.

3.3.2.12. Feature of Work.
All activities shall be identified in the project schedule according to the feature of work to which the activity belongs. Feature of work refers, but is not limited to a work breakdown structure for the project. The feature of work for each activity shall be identified by the Feature of Work Code.

3.3.3. Scheduled Project Completion.
The schedule interval shall extend from notice-to-proceed to the contract completion date.

3.3.3.1. Project Start Date.
The schedule shall start no earlier than the date that the Notice to Proceed (NTP) was acknowledged. The Contractor shall include as the first activity in the project schedule an activity called “Start Project”. The “Start Project” activity shall have: a “ES” constraint, a constraint date equal to the date that the NTP was acknowledged, and a zero day duration.

3.3.3.2. Constraint of Last Activity.
Completion of the last activity in the schedule shall be constrained by the contract completion date. Calculation on project updates shall be such that if the early finish of the last activity falls after the contract completion date, then the float calculation shall reflect a negative float on the critical path. The Contractor shall include as the last activity in the project schedule an activity call “End Project”. The “End Project” activity shall have: a “LF” constraint, a constraint date equal to the completion date for the project, and a zero day duration.

3.3.3.3. Early Project Completion.
In the event the project schedule shows completion, the project prior to the contract completion date, the Contractor shall identify those activities that have been accelerated and/or those activities that are scheduled in parallel to support the Contractor’s “early” completion. Contractor shall specifically address each of the activities noted at every project schedule update period to assist the Contracting Officer’s Representative to evaluate the Contractor’s ability to actually complete prior to the contract period.

3.3.4. Interim Completion Dates.

Contractually specified interim completion dates shall also be constrained to show negative float if the early finish date of the last activity in that phase falls after the interim completion date.

3.3.4.1. Start Phase.
The Contractor shall include as the first activity for a project phase an activity called “Start Phase X” where “X” refers to the phase of work. The “Start Phase X” activity shall have: a “ES” constraint, a constraint date equal to the date that the NTP was acknowledged, and a zero day duration.

3.3.4.2. End Phase.
The Contractor shall include as the last activity in a project phase an activity called “End Phase X” where “X” refers to the phase of work. The “End Phase X” activity shall have: a “LF” constraint, a constraint date equal to the completion date for the project, and a zero day duration.

3.3.4.3. Phase X.
The Contractor shall include a hammock type activity for each project phase called “Phase X” where “X:” refers to the phase of work. The “Phase X” activity shall be logically tied to the earliest and latest activities in the phase.

3.3.5. Default Progress Data Disallowed.
Actual Start and Finish dates shall not be automatically updated by default mechanisms that may be included in CPM scheduling software systems. Actual Start and Finish dates on the CPM schedule shall match those dates provided from Contractor Quality Control Reports. Failure of the Contractor to document the Actual Start and Finish dates on the Daily Quality Control report for every in progress or completed activity and insure that the data contained on the Daily Quality Control reports is the sole basis for schedule updating shall result in the disapproval of the Contractor’s schedule and the inability of the Contracting Officer’s Representative to evaluate Contractor progress for payment purposes.

3.3.6. Out-of-Sequence Progress.
Activities that have posted progress without predecessors being completed (Out-of-Sequence Progress) shall be allowed only by the case-by-case approval of the Contracting Officer’s Representative. The Contracting Officer’s Representative may direct that changes in schedule logic be made to correct any or all out-of-sequence work.

3.3.7. Extended Non-Work Periods.
Designation of Holidays to account for non-work periods of over [5] [_____] days shall not be allowed. Non-work periods of over [5] [_____] days shall be identified by addition of activities that represent the delays. Modifications to the logic of the project schedule shall be made to link those activities that may have been impacted by the delays to the newly added delay activities.

3.3.8. Negative Lags.
Lag durations contained in the project schedule shall not have a negative value.

3.4. Project Schedule Submissions.
The Contractor shall provide the submissions as described below. The data disk, reports, and network diagrams required for each submission are contained in paragraph SUBMISSION REQUIREMENTS.

3.4.1 Preliminary Project Schedule Submission.
The Preliminary Project Schedule, defining the Contractor’s planned operations for the first [60] [_____] calendar days shall be submitted for approval within [20] [_____] calendar days after Notice to Proceed is acknowledged. The approved preliminary schedule shall be used for payment purposes not to exceed [60] [_____] calendar days after Notice to Proceed.

3.4.2. Initial Project Schedule Submission.
The Initial Project Schedule shall be submitted for approval within [40] [_____] calendar days after Notice to Proceed. The schedule shall provide a reasonable sequence of activities which represent work through the entire project and shall be at a reasonable level of detail.

3.4.3. Periodic Schedule Updates.
Based on the result of progress meetings, specified in “Periodic Progress Meetings,” the Contractor shall submit periodic schedule updates. These submissions shall enable the Contracting Officer’s Representative or to assess Contractor’s progress. If the Contractor fails or refuses to furnish the information and project schedule data, which in the judgement of the Contracting Officer’s Representative or authorized representative, is necessary for verifying the contractor’s progress, the Contractor shall be deemed not to have provided an estimate upon which progress payment may be made.

3.4.4. Standard Activity Coding Dictionary.
The Contractor shall submit, with the Initial Project Schedule, a coding scheme that shall be used throughout the project for all activity codes contained in the schedule. The coding scheme submitted shall list the values for each activity code category and translate those values into project specific designations. For example, a Responsibility Code Value, “ELE”, may be identified as “Electrical Subcontractor.” Activity code values shall represent the same information throughout the duration of the contract. Once approved with the Initial Project Schedule submission, changes to the activity coding scheme must be approved by the Contracting Officer’s Representative.

3.5. Submission Requirements.
The following items shall be submitted by the Contractor for the initial submission, and every periodic project schedule update throughout the life of the project:

3.5.1. Data Disks.
[Three] [_____] data disks containing the project schedule shall be provided. Data on the disks shall be in the format specified in [_____].

3.5.1.1. File Medium.
Required data shall be submitted on [3.5] [_____] disks, formatted to hold [1.44 MB] [_____] of data, under the [MS-DOS] [_____] [Version 5.0] [_____] operating system.

3.5.1.2. Disk Label.
A permanent exterior label shall be affixed to each disk submitted. The label shall indicate the type of schedule (Initial, Update, or Change), full contract number, project name, project location, data date, name and telephone number or person responsible for the schedule, and the [MS-DOS] [_____] version used to format the disk.

3.5.1.3. File Name.
Each file submitted shall have a name related to either the schedule data date, project name, or contract number. The Contractor shall develop a naming convention that will insure that the names of the files submitted are unique. the Contractor shall submit the file naming convention to the Contracting Officer’s Representative for approval.

3.5.2. Narrative Report.
A Narrative Report shall be provided with each update of the project schedule. This report shall be provided as the basis of the Contractor’s progress payment request. The Narrative Report shall include: a description of activities along the [4] [_____] most critical paths, a description of current and anticipated problem areas or delaying factors and their impact, and an explanation of corrective actions taken.

3.5.3. Approved Changes Verification.
Only project schedule changes that have been previously approved by the Contracting Officer’s Representative shall be included in the schedule submission. The Narrative Report shall specifically reference, on an activity by activity basis, all changes made since the previous period and relate each change to documented, approved schedule changes.

3.5.4. Schedule Reports.

format for each activity for the schedule reports listed below shall contain: Activity Numbers, Activity Description, Original Duration, Remaining Duration, Early Start Date, Early Finish Date, Late Start Date, Late Finish Date, Total Float. Actual Start and Actual Finish Dates shall be printed for those activities in-progress or completed.

3.5.4.1. Activity Report.
A list of all activities sorted according to [activity number] [or] ["I-NODE" AND "J-NODE"] and then sorted according to Early Start Date. For completed activities the Actual Start Date shall be used as the secondary sort.

3.5.4.2. Logic Report.
A list of Preceding and Succeeding activities for every activity in ascending order by activity number and then sorted according to Early Start Date. For completed activities the Actual Start Date shall be used as the secondary sort.

3.5.4.3. Total Float Report.
A list of all activities sorted in ascending order of total float. Activities which have the same amount of total float shall be listed in ascending order of Early Start Dates.

3.5.4.4. Earnings Report.
A compilation of the Contractor's Total Earnings on the project from the Notice to Proceed until the most recent Monthly Progress Meeting. This report shall reflect the Earnings of specific activities based on the agreements made in the field and approved between the Contractor and Contracting Officer's Representative at the most recent Monthly Progress Meeting. Provided that the Contractor has provided a complete schedule update, this report shall serve as the basis of determining Contractor Payment. Activities shall be grouped by bid item and sorted by activity numbers. This report shall: sum all activities in a bid item and provide a bid item percent; complete and sum all bid items to provide a total project percent complete. The printed report shall contain, for each activity: [Activity Number] [or] ["i-node" and "j-node"], Activity Description, Original Budgeted Amount, Total Quantity, Quantity to Date, Percent Complete (based on cost), Earnings to Date.

3.5.5. Network Diagram.
The network diagram shall be required on the initial schedule submission [and on [monthly] [or] [quarterly] schedule update submissions] [_____]. The network diagram shall depict and display the order and interdependence of activities and the sequence in which the work is to be accomplished. The Contracting Officer's Representative will use, but is not limited to, the following conditions to review compliance with this paragraph:

3.5.5.1. Continuous Flow.
Diagrams shall show a continuous flow from left to right with no arrows from right to left. The activity or event number, description, duration, and estimated earned value shall be shown on the diagram.

3.5.5.2. Project Milestone Dates.
Dates shall be shown on the diagram for start of project, any contract required interim completion dates, and contract completion dates.

3.5.5.3. Critical Path.
The critical path shall be clearly shown.

3.5.5.4. Banding.
Activities shall be grouped to assist in the understanding of the activity sequence. Typically, this flow will group activities by category of work, work area and/or responsibility.

3.5.5.5. S-Curves.
Earnings curves showing projected early and late earnings and earnings to date.

3.6 PERIODIC PROGRESS MEETINGS
Progress meetings to discuss payment shall include a monthly on-site meeting or other regular intervals mutually agreed to at the preconstruction conference. During this meeting the Contractor will describe, on an activity by activity basis, all proposed revisions and adjustments to the project schedule required to reflect the current status of the project. The Contracting Officer's Representative will approve activity progress, proposed revisions, and adjustments as appropriate.

3.6.1. Meeting Attendance.
The Contractor's Project Manager and Scheduler shall attend the regular progress meeting.

3.6.2. Update Submission Following Progress Meeting.
A complete update of the project schedule containing all approved progress, revisions, and adjustments, based on the regular progress meeting, shall be submitted not later than 4 working days after the monthly progress meeting.

3.6.3. Progress Meeting Contents.
Update information, including Actual Start Dates, Actual Finish Dates, Remaining Durations, and Cost to Date shall be subject to the approval of the Contracting Officer's Representative. The following minimum set of items which the Contractor shall address, on an activity by activity basis, during each progress meeting.

3.6.3.1. Start and Finish Dates.
The Actual Start and Actual Finish dates for each activity currently in-progress or completed activities.

3.6.3.2. Time Completion.
The estimated Remaining Duration for each activity in-progress. Time-based progress calculations must be based on Remaining Duration for each activity.

3.6.3.3. Cost Completion.
The earnings for each activity started. Payment shall be based on earnings for each in-progress or completed activity. Payment for individual activities shall not be made for work that contains quality defects. A portion of the overall project amount may be retained based on delays of activities.

3.6.3.4. Logic Changes.
All logic changes pertaining to Notice to Proceed on change orders, change orders to be incorporated into the schedule, contractor proposed changes in work sequence, corrections to schedule logic for out-of-sequence progress, [lag durations,] and other changes that have been made pursuant to contract provisions shall be specifically identified and discussed.

3.6.3.5. Other Changes.
Other changes required due to delays in completion of any activity or group of activities are those delays beyond the Contractors control such as strikes and unusual weather. Also included are delays encountered due to submittals, Government Activities, deliveries or work stoppage which makes re-planning the work necessary, and when the schedule does not represent the actual prosecution and progress of the work.

3.7. Requests For Time Extensions.
In the event the Contractor requests an extension of the contract completion date, he shall furnish such justification, project schedule data and supporting evidence as the Contracting Officer's Representative may deem necessary for a determination as to whether or not the Contractor is entitled to an extension of time under the provisions of the contract. Submission of proof of delay, based on revised activity logic, duration, and costs (updated to the specific date that the delay occurred) is obligatory to any approvals.

3.7.1. Justification of Delay.
The project schedule must clearly display that the Contractor has used, in full, all the float time available for the work involved with this request. The Contracting Officer's Representative's determination as to the

number of allowable days of contract extension, shall be based upon the project schedule updates in effect for the time period in question and other factual information. Actual delays that are found to be caused by the Contractor's own actions, which result in the extension of the schedule, shall not be a cause for a time extension to the contract completion date.

3.7.2. Submission Requirements.
The Contractor shall submit a justification for each request for a change in the contract completion date of under two weeks based upon the most recent schedule update at the time of the Notice to Proceed or constructive direction issued for the change. Such a request shall be in accordance with the requirements of other appropriate Contract Clauses and shall include, as a minimum:

- A list of affected activities, with their associated project schedule activity number.
- A brief explanation of the causes of the change.
- An analysis of the overall impact of the changes proposed.
- A sub-network of the affected area.

Activities impacted in each justification for change shall be identified by a unique activity code contained in the required data file.

3.7.3. Additional Submission Requirements.
For any request for time extension for over 2 weeks, the Contracting Officer's Representative may request an interim update with revised activities for a specific change request. The Contractor shall provide this disk within 4 days of the Contracting Officer's Representative's request.

3.8. Directed Changes.
If Notice to Proceed (NTP) is issued for changes prior to settlement of price and/or time, the Contractor shall submit proposed schedule revisions to the Contracting Officer's Representative within 2 weeks of the NTP being issued. The proposed revisions to the schedule will be approved by the Contracting Officer's Representative prior to inclusion of those changes within the project schedule. If the Contractor fails to submit the proposed revisions, the Contracting Officer's Representative may furnish the Contractor suggested revisions to the project schedule. The Contractor shall include these revisions in the project schedule until the Contractor submits revisions, and final changes and impacts have been negotiated. If the Contractor has any objections to the revisions furnished by the Contracting Officer's Representative, then the Contractor shall advise the Contracting Officer's Representative within 2 weeks of receipt of the revisions. Regardless of the objections, the Contractor will continue to update their schedule with the Contracting Officer's Representative's revisions until a mutual agreement in the revisions may be made. If the Contractor fails to submit alternative revisions within 2 weeks of receipt of the Contracting Officer's Representative's proposed revisions, the Contractor will be deemed to have concurred with the Contracting Officer's Representative's proposed revisions. The proposed revisions will then be the basis for an equitable adjustment for performance of the work.

3.9. Ownership Of Float.
Float available in the schedule, at any time, shall not be considered for the exclusive use of either the Government or the Contractor.

DESIGN/BUILD SUBMITTAL PROCEDURES

1. General

1.1.Submittal Classification. Submittals are classified as follows:

1.1.1. Design Submittals. Administrative Contracting Officer review is required for all design. The Government will review all 50% and 95% design submittals for conformance with the technical requirements of the solicitation. Section 01012, Design After Award, covers the design submittal and review process in detail.

1.1.2. Construction Submittals.

1.1.2.1 Submittal Definitions. The submittals described below are those required and further described in other sections of the specifications. Submittals required by the CONTRACT CLAUSES and other non-technical parts of the contract are not included in this section.

SD-01 Data
Work to be Performed by Contractor.
Submittal Registers.
Submittals which provide calculations, descriptions, or documentation regarding the work.

SD-04 Drawings
Submittals which graphically show relationship of various components of the work, schematic diagrams of systems, details of fabrication, layouts of particular elements, connections, and other relational aspects of the work.

As-Built Drawings

Equipment Layout Drawings

SD-06 Instructions.
Preprinted material describing installation of a product, system or material, including special notices and material safety data sheets, if any, concerning impedances, hazards, and safety precautions.

SD-07 Schedules
Progress Schedules.

Schedules for Construction Contracts.

Contractor Prepared Network Analysis.

Tabular lists showing location, features, or other pertinent information regarding products, materials, equipment, or components to be used in the work.

SD-08 Statements
Accident Prevention Plan.

Hazard Analysis Plan.

Environmental Protection Plan.

Submittal Procedures.

A document, required of the Contractor, or through the Contractor, from a supplier, installer, manufacturer, or other lower tier Contractor, the purpose of which is to confirm the quality or orderly progression of a portion of the work by documenting procedures, acceptability of methods or personnel, qualifications, or other verifications of quality.

SD-09 Reports
Reports of inspections or tests, including analysis and interpretation of test results. Each report shall be properly identified. Test methods used shall be identified and test results shall be recorded.

SD-13 Certificates
Statements signed by responsible official of a manufacturer of a product, system or material, attesting that the product, system or material meets specified requirements.

SD-14 Samples
Samples including both fabricated and unfabricated physical examples of materials, products, and units of work as complete units or as portions of units of work.

SD-18 Records
Documentation to record compliance with technical or administrative requirements.

SD-19 Operation and Maintenance Manuals
Data which forms a part of an operation and maintenance manual.

1.1.2.2. Designer of Record Approval.
Designer of Record approval is required for extensions of design, critical materials, any deviations from the solicitation, the accepted proposal, or the completed design, equipment whose compatibility with the entire system must be checked, and other items as designated by the Contracting Officer's Representative. Within the terms of the Contract Clause entitled "Specifications and Drawings for Construction", they are considered to be "shop drawings". The Contractor shall provide the Government the number of copies designated hereinafter of all Designer of Record approved submittals. The Government may review any or all Designer of Record approved submittals for conformance to the Solicitation and Accepted Proposal. The Government will review all submittals designated as deviating from the Solicitation or Accepted Proposal, as described below.

1.1.2.3. Government Approved Construction Submittals.
Administrative Contracting Officer approval is required for any deviations from the Solicitation or Accepted Proposal and other items as designated by the Contracting Officer' Representative. Within the terms of the Contract Clause entitled "Specifications and Drawings for Construction", they are considered to be "shop drawings".

1.1.2.4 Government Reviewed Extension of Design. Government review is required for extension of design construction submittals, used to define contract conformity, and for deviation from the completed design. Review will be only for conformance with the contract requirements. Included are only those construction submittals for which the Designer of Record design documents do not include enough detail to ascertain contract compliance. Government review is not required for extensions of design such as structural steel or reinforcement shop drawings.

1.1.2.5 Information Only.
All submittals not requiring Designer of Record or Government approval will be for information only. They are not considered to be "shop drawings" within the terms of the Contract Clause referred to above.

1.2. Government Reviewed Or "Approved" Submittals.
The Contracting Officer's Representative conformance review or approval of submittals shall not be construed as a complete check, but will indicate only that the design, general method of construction, materials, detailing and other information appear to meet the Solicitation and Accepted Proposal. Government Review or approval will not relieve the Contractor of the responsibility for any error which

may exist, as the Contractor, under the Design and CQC requirements of this contract, is responsible for design, dimensions, all design extensions, such as the design of adequate connections and details, etc., and the satisfactory construction of all work. After submittals have been reviewed for conformance or approved, as applicable, by the Contracting Officer' Representative, no resubmittal for the purpose of substituting materials or equipment will be considered unless accompanied by an explanation of why a substitution is necessary.

1.3. Disapproved Submittals
The Contractor shall make all corrections required by the Contracting Officer's Representative, obtain the Designer of Record's approval, when applicable, and promptly furnish a corrected submittal in the form an number of copies specified for the initial submittal. Any "information only" submittal found to contain errors or unapproved deviations from the Solicitation or Accepted Proposal shall be resubmitted as one requiring "approval" action, requiring both Design of Record and Government approval. If the Contractor considers any correction indicated by the Government on the submittals to constitute a change to the contract, it shall promptly provide a notice in accordance with the Contract Clause "Changes" to the Contracting Officer's Representative.

1.4. Withholding Of Payment
No payment for materials incorporated in the work will be made if all required Design of Record or required Government approvals have not been obtained. No payment will be made for any materials incorporated into the work for any conformance review submittals or information only submittals found to contain errors or deviations from the Solicitation or Accepted Proposal.

2. Products

2.1. Design Submittals.
The Contractor shall design submittals in accordance with Section 01012 entitled "DESIGN AFTER AWARD".

2.2. Construction Submittals.

2.2.1. General.
The Contractor shall make submittals as required by the specifications. The Contracting Officer's Representative may request submittals in addition to those specified when deemed necessary to adequately describe the work covered in the respective sections. Units of weights and measures used on all submittals shall be the same as those used in the contract drawings. Each submittal shall be complete and in sufficient detail to allow ready determination of compliance with contract requirements. Prior to submittal, the Contractor's Quality Control (CQC) representative, and the Designer of Record, as applicable, above shall check, approve and stamp, sign, and date each item, indicating action taken. Proposed deviations from the contract requirements shall be clearly identified. Submittals shall include items such as: Contractor's, manufacturer's, or fabricator's drawings; descriptive literature including (but not limited to) catalog cuts, diagrams, operating charts or curves; test reports; test cylinders; samples; O&M manuals (including parts list); certifications; warranties; and other such required submittals. Submittals requiring Government approval shall be scheduled and made prior to the acquisition of the material or equipment covered thereby. Samples remaining upon completion of the work shall be picked up and disposed of in accordance with manufacturer's Material Safety Data Sheets (MSDS) and in compliance with existing laws and regulations.

2.2.2. Submittal Register (ENG Form 4288)
The Contractor's Designer(s) of Record shall develop a complete list of submittals during design. The Designer of Record shall identify required submittals in the specifications. Use the list to prepare ENG Form 4288 Submittal Register or a computerized equivalent. The list may not be all inclusive and additional submittals may be required by other parts of the contract. The Contractor is required to complete ENG Form 4288 (including columns "a" through "r") and submit to the Contracting Officer for approval within 30 calendar days after Notice to Proceed. The approved submittal register will serve as a scheduling document for submittals and will be used to control submittal actions throughout the contract

period. The submit dates and need dates used in the submittal register shall be coordinated with dates in the Contractor prepared progress schedule. Updates to the submittal register showing the Contractor action codes and actual dates with Government action codes and actual dates shall be submitted monthly or until all submittals have been satisfactorily completed. When the progress schedule is revised, the submittal register shall also be revised and both submitted for approval.

2.2.3. Scheduling
Schedule those submittals covering component items forming a system or items that are interrelated to be coordinated and submitted concurrently. Also, schedule Certifications to be submitted with the pertinent drawings. Allow adequate time (a minimum of 30 calendar days exclusive of mailing time) and indicate on the register for Government review or approval. No delay damages or time extensions will be allowed for time lost in late submittals.

2.2.4. Transmittal Form (ENG Form 4025)
The sample transmittal form (ENG Form 4025) attached to this section shall be for transmitting both Government approved and information only submittals in accordance with the instructions on the reverse side of the form. The Government will furnish blank forms to the Contractor. Properly complete this form by filling out all the heading blank spaces and identifying each item submitted. Exercise special care to ensure proper listing of the specification paragraph and/or sheet number of the contract drawings pertinent to the data submitted for each item.

2.2.5. Submittal Procedure Make submittals as follows:

2.2.5.1. Procedures.
The Government will further discuss detailed submittal procedures with the Contractor at the pre-construction conference.

2.2.5.2. Deviations.
On submittals for which the Contractor requests proposed deviations, check the column “variation” of ENG Form 4025. The Contractor shall set forth in writing the reason for any deviations and annotate such deviations on the submittal. As stated above, the Contractor’s Designer of Record’s approval is required for any proposed deviation. The Government reserves the right to rescind inadvertent approval of submittals containing unnoted deviations.

2.2.6. Control of Submittals
The Contractor shall carefully control his procurement operations to ensure that each individual submittal is made on or before the Contractor scheduled submittal date shown on the approved “Submittal Register” so the material needed date is not threatened.

2.2.7. Government Conformance Review and Approved Submittals: Contractor shall submit 6 copies. Upon completion of review of submittals requiring Government approval, the Government will identify the submittals as having received approval by so stamping and dating. The Contracting Officer’s Representative will retain 5 copies of the submittal and return 1 copies of the submittal to the Contractor. If the Government performs a conformance review of other Designer of Record approved submittals, the submittals will be so identified and returned, as described above.

2.2.8 Information Only Submittals: Contractor shall submit 5 copies. Normally the Government will not return submittals for information only. No action of the Contracting Officer’s Representative is required on information only submittals. This does not relieve the Contractor from the obligation to furnish material conforming to the plans and specifications; will not prevent the Contracting Officer’s Representative from requiring removal and replacement of nonconforming material incorporated in the work; and does not relive the Contractor of the requirement to furnish samples for testing by the Government laboratory or for check testing by the Government in those instances where the technical specifications so prescribe.

2.2.9 Stamps
Stamps used by the Contractor’s Designer of Record and the Contractor’s designed Quality

Control person on the submittal data to certify that the submittal meets contract requirements shall be similar to the following (use two stamps for submittals reviewed by both):

CONTRACTOR
(Firm Name)

_____ Approved
Approved with corrections as noted on submittal
_____ data and/or attached sheet(s).

SIGNATURE: _____
TITLE: (Designer of Record)
DATE: _____

SECTION TABLE OF CONTENTS

DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01430

ENVIRONMENTAL PROTECTION

-- End of Section Table of Contents --

SECTION 01430

ENVIRONMENTAL PROTECTION

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

STATE OF HAWAII DEPARTMENT OF HEALTH (HIDOH)

HIDOH, Chapter 43	Administrative Rules, Title 11, Community Noise Control for Oahu
HIDOH, Chapter 59	Administrative Rules, Ambient Air Quality Standards
HIDOH, Chapter 60	Administrative Rules, Air Pollution Control

1.2 GENERAL REQUIREMENTS

This section covers prevention of environmental pollution and damage as the result of construction operations under this contract and for those measures set forth in the TECHNICAL REQUIREMENTS. For the purpose of this specification, environmental pollution and damage is defined as the presence of chemical, physical, or biological elements or agents which adversely affect human health or welfare; unfavorably alter ecological balances of importance to human life; affect other species of importance to man; or degrade the utility of the environment for aesthetic, cultural and/or historical purposes. The control of environmental pollution and damage requires consideration of air, water, and land, and includes management of visual aesthetics, noise, solid waste, radiant energy and radioactive materials, as well as other pollutants.

1.2.1 Subcontractors

Assurance of compliance with this section by subcontractors will be the responsibility of the Contractor.

1.2.2 Notification

The Contracting Officer will notify the Contractor in writing of any observed noncompliance with the aforementioned Federal, State or local laws or regulations, permits, and other elements of the Contractor's environmental protection plan. The Contractor shall, after receipt of such notice, inform the Contracting Officer of proposed corrective action and take such action as may be approved. If the Contractor fails to comply promptly, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No time extensions will be granted or costs or damages allowed to the Contractor for any such suspension.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-06 Test Records

Environmental Protection Plan; G.

Within 30 calendar days of receipt of Notice to Proceed, the Contractor shall submit in writing an environmental protection plan. Approval of the Contractor's plan will not relieve the Contractor of his responsibility for adequate and continuing control of pollutants and other environmental protection measures. The environmental protection plan shall include but not be limited to the following:

a. A list of Federal, State, and local laws, regulations, and permits concerning environmental protection, pollution control and abatement that are applicable to the Contractor's proposed operations and the requirements imposed by those laws, regulations, and permits.

b. Methods for protection of features to be preserved within authorized work areas. The Contractor shall prepare a listing of methods to protect resources needing protection; i.e., trees, shrubs, vines, grasses and ground cover, landscape features, air and water quality, fish and wildlife, soil, historical, archeological, and cultural resources.

c. Procedures to be implemented to provide the required environmental protection and to comply with the applicable laws and regulations. The Contractor shall set out the procedures to be followed to correct pollution of the environment due to accident, natural causes, or failure to follow the procedures set out in accordance with the environmental protection plan.

d. Location of the solid waste disposal area.

e. Drawings showing locations of any proposed temporary excavations or embankments for haul roads, stream crossings, material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials.

f. Environmental monitoring plans for the job site, including land, water, air, and noise monitoring.

g. Traffic control plan.

h. Methods of protecting surface and ground water during construction activities.

i. Work area plan showing the proposed activity in each portion of the area and identifying the areas of limited use or nonuse. Plan should include measures for marking the limits of use areas.

j. Plan of borrow area(s).

k. Training for his personnel during the construction period.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION

3.1 PROTECTION OF ENVIRONMENTAL RESOURCES

The environmental resources within the project boundaries and those affected outside the limits of permanent work under this contract shall be protected during the entire period of this contract. The Contractor shall confine his activities to areas defined by the drawings and specifications.

3.1.1 Land Resources

Prior to the beginning of any construction, the Contractor shall identify all land resources to be preserved within the Contractor's work area. Except in areas indicated on the drawings or specified to be cleared, the Contractor shall not remove, cut, deface, injure, or destroy land resources including trees, shrubs, vines, grasses, topsoil, and land forms without special permission from the Contracting Officer. No ropes, cables, or guys shall be fastened to or attached to any trees for anchorage unless specifically authorized. Where such special emergency use is permitted, the Contractor shall provide effective protection for land and vegetation resources at all times as defined in the following subparagraphs.

3.1.1.1 Work Area Limits

Prior to any construction, the Contractor shall mark the areas that are not required to accomplish all work to be performed under this contract. Isolated areas within the general work area which are to be saved and protected shall also be marked or fenced. Monuments and markers shall be protected before construction operations commence. Where construction operations are to be conducted during darkness, the markers shall be visible. The Contractor shall convey to his personnel the purpose of marking and/or protection of all necessary objects.

3.1.1.2 Protection of Landscape

Trees, shrubs, vines, grasses, land forms and other landscape features indicated and defined on the drawings to be preserved shall be clearly identified by marking, fencing, or wrapping with boards, or any other approved techniques.

3.1.1.3 Reduction of Exposure of Unprotected Erodible Soils

Earthwork brought to final grade shall be finished as indicated and specified. Side slopes and back slopes shall be protected as soon as practicable upon completion of rough grading. All earthwork shall be planned and conducted to minimize the duration of exposure of unprotected soils. Except in instances where the constructed feature obscures borrow areas, quarries, and waste material areas, these areas shall not initially be cleared in total. Clearing of such areas shall progress in reasonably sized increments as needed to use the areas developed as approved by the Contracting Officer.

3.1.1.4 Protection of Disturbed Areas

Such methods as necessary shall be utilized to effectively prevent erosion and control sedimentation, including but not limited to the following:

Retardation and Control of Runoff: Runoff from the construction site shall be controlled by construction of diversion ditches, benches, and berms to retard and divert runoff to protected drainage courses, and any measures required by areawide plans approved under Paragraph 208 of the Clean Water Act.

3.1.1.5 Contractor Facilities and Work Areas

a. Location of Field Offices, Storage, and Other Contractor Facilities: The Contractors' field offices, staging areas, stockpile storage, and temporary buildings shall be placed in areas designated on the drawings or as directed by the Contracting Officer. Temporary movement or relocation of Contractor facilities shall be made only on approval by the Contracting Officer.

b. Borrow Areas on Government Property: Borrow areas shall be managed to minimize erosion and to prevent sediment from entering nearby waters.

c. Spoil Areas on Government Property: Spoil areas shall be managed and controlled to limit spoil to areas designated on the drawings and prevent erosion of soil or sediment from entering nearby waters. Spoil areas shall be developed in accordance with the grading plan indicated on the drawings.

d. Temporary Excavations and Embankments: Temporary excavations and embankments for plant and/or work areas shall be controlled to protect adjacent areas from despoilment.

3.1.2 Disposal of Wastes

Disposal of wastes shall be as specified in Section 01572 CONSTRUCTION AND DEMOLITION as specified hereinafter.

3.1.2.1 Solid Wastes

Solid wastes (excluding clearing debris) shall be placed in containers which are emptied on a regular schedule. All handling and disposal shall be conducted to prevent contamination. Segregation measures shall be employed such that no hazardous or toxic waste will become commingled with solid waste. The Contractor shall transport all solid waste off Government property and dispose of it in compliance with Federal, State, and local requirements for solid waste disposal. Waste materials shall be hauled to the Government landfill site designated by the Contracting Officer. The Contractor shall comply with site procedures and with Federal, State, and local laws and regulations pertaining to the use of landfill areas.

3.1.2.2 Chemical Wastes:

Chemical wastes shall be stored in corrosion resistant containers, removed from the work area and disposed of in accordance with Federal, State, and local laws and regulations.

3.1.2.3 Hazardous Wastes:

The Contractor shall take sufficient measures to prevent spillage of hazardous and toxic materials during dispensing and shall collect waste in suitable containers observing compatibility. The Contractor shall transport all hazardous waste off Government property and dispose of it in compliance with Federal and local laws and regulations. Spills of hazardous or toxic materials shall be immediately reported to the Contracting Officer. Cleanup and cleanup costs due to spills shall be the responsibility of the Contractor.

3.1.3 Water Resources

The Contractor shall keep construction activities under surveillance, management, and control to avoid pollution of surface and ground waters. Special management techniques as set out below shall be implemented to control water pollution by the listed construction activities which are included in this contract. In particular, toxic or hazardous chemicals shall not be applied to soil or vegetation in a manner that may cause contamination of the fresh water reserve.

3.1.4 Air Resources

The Contractor shall keep construction activities under surveillance, management and control to minimize pollution of air resources. All activities, equipment, processes, and work operated or performed by the Contractor in accomplishing the specified construction shall be in strict accordance with HIDOH, Chapter 59, HIDOH, Chapter 60, and all Federal emission and performance laws and standards. Ambient Air Quality Standards set by the Environmental Protection Agency shall be maintained for those construction operations and activities specified in this section. Special management techniques as set out below shall be implemented to control air pollution by the construction activities which are included in the contract.

3.1.4.1 Particulates

a. Dust particles, aerosols, and gaseous by-products from all construction activities, processing and preparation of materials, such as from asphaltic batch plants, shall be controlled at all times, including weekends, holidays and hours when work is not in progress.

b. The Contractor shall maintain all excavations, stockpiles, haul roads, permanent and temporary access roads, plant sites, spoil areas, borrow areas, and all other work areas within or outside the project boundaries free from particulates which would cause the air pollution standards mentioned in paragraph Air Resources, herein before, to be exceeded or which would cause a hazard or a nuisance. Sprinkling, chemical treatment of an approved type, light bituminous treatment, baghouse, scrubbers, electrostatic precipitators or other methods will be permitted to control particulates in the work area. Sprinkling, to be efficient, must be repeated at such intervals as to keep the disturbed area damp at all times. The Contractor must have sufficient competent equipment available to accomplish this task. Particulate control shall be performed as the work proceeds and whenever a particulate nuisance or hazard occurs.

3.1.4.2 Hydrocarbons and Carbon Monoxide

Hydrocarbons and carbon monoxide emissions from equipment shall be controlled to Federal and State allowable limits at all times.

3.1.4.3 Odors

Odors shall be controlled at all times for all construction activities, processing and preparation of materials.

3.1.4.4 Monitoring of Air Quality

Monitoring of air quality shall be the responsibility of the Contractor. All air areas affected by the construction activities shall be monitored by the Contractor.

3.1.5 Sound Intrusions

The Contractor shall keep construction activities under surveillance, and control to minimize damage to the environment by noise. The Contractor shall comply with the provisions of HIDOH, Chapter 43.

3.2 POST CONSTRUCTION CLEANUP

The Contractor shall clean up area(s) used for construction.

3.3 RESTORATION OF LANDSCAPE DAMAGE

The Contractor shall restore all landscape features damaged or destroyed during construction operations outside the limits of the approved work areas. Such restoration shall be in accordance with the plan submitted for approval by the Contracting Officer. This work will be accomplished at the Contractor's expense.

3.4 MAINTENANCE OF POLLUTION CONTROL FACILITIES

The Contractor shall maintain all constructed facilities and portable pollution control devices for the duration of the contract or for that length of time construction activities create the particular pollutant.

3.5 TRAINING OF CONTRACTOR PERSONNEL IN POLLUTION CONTROL

The Contractor shall train his personnel in all phases of environmental protection. The training shall include methods of detecting and avoiding pollution, familiarization with pollution standards, both statutory and contractual, and installation and care of facilities (vegetative covers, and instruments required for monitoring purposes) to ensure adequate and continuous environmental pollution control.

-- End of Section --

CONTRACTOR QUALITY CONTROL (DESIGN-BUILD CONSTRUCTION)

1. General

1.1. References.
The publications listed below form a part of this specification to the extent referenced. The Publications are referred to in the text by basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 3740	(1994a) Minimum Requirements for Agencies Engaged In the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.
ASTM E 329	(1995b) Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction.

1.2. Payment
No separate payment will be made for providing and maintaining an effective Quality Control program, and all costs associated therewith shall be included in the applicable unit prices or lump-sum prices contained in the Bidding Schedule.

2. Products (Not Applicable)

3. Execution.

3.1. General.
The Contractor is responsible for quality control and shall establish and maintain an effective quality control system in compliance with the Contract Clause titled “Inspection of Construction.” The quality control system shall consist of plans, procedures, and organization necessary to produce an end product which complies with the contract requirements. The system shall cover all design and construction operations, both onsite and offsite, and shall be keyed to the proposed design and construction sequence. The project superintendent will be held responsible for the quality of work on the job and is subject to removal by the Contracting Officer for non-compliance with quality requirements specified in the contract. The project superintendent in this context shall mean the individual with the responsibility for the overall management of the project including quality and production.

3.2. Quality Control Plan.

3.2.1 General
The Contractor shall furnish for review by the Government, not later than 10 days after receipt of notice to proceed, the Contractor Quality Control (CQC) Plan proposed to implement the requirements of the Contract Clause titled “Inspection of Construction.” The plan shall identify personnel, procedures, control, instructions, test, records, and forms to be used. The Government will consider an interim plan for the first 60 days of operation. Design and Construction will be permitted to begin only after acceptance of the CQC Plan or acceptance of an interim plan applicable to the particular feature of work to be started. Work outside of the features of work included in an accepted interim plan will not be permitted to begin until acceptance of a CQC Plan or another interim plan containing the additional features of work to be started.

3.2.2 Design Quality Control (DQC) Plan.
The Contractor’s DQC Plan shall provide and maintain an effective quality control program which will assure that all services required by this design-build contract are performed and provided in a manner that meets professional architectural and engineering quality standards. As a minimum, all documents shall be technically reviewed by competent, independent reviewers identified in the DQC Plan. The same element that produced the product shall not perform the independent technical review (ITR). In addition, the DQC Plan shall incorporate the Lessons Learned Databases provided by the Government. The

Contractor shall correct errors and deficiencies in the design documents prior to submitting them to the Government.

The Contractor shall include the design schedule in the master project schedule, showing the sequence of events involved in carrying out the project tasks within the specific contract period. This should be at a detailed level of scheduling sufficient to identify all major tasks including those that control the flow of work. The schedule shall include review and correction periods associated with each item. This should be a forward planning as well as a project monitoring tool. The schedule reflects calendar days and not dates for each activity. If the schedule is changed, the Contractor shall submit a revised schedule reflecting the change within seven calendar days. The Contractor shall include in the DQC Plan the discipline-specific checklists to be used during the design and quality control of each submittal. These completed checklists shall be submitted at each design phase as part of the project documentation. Example checklists can be found in ER 1110-1-12.

The DQC Plan shall be implemented by an assigned person with the Contractor's organization who has the responsibility of being present during the times work is in progress, and shall be cognizant of and assure that all documents on the project have been coordinated. This individual shall be a person who has verifiable engineering or architectural design experience and is a registered professional engineer or architect.

Contractor shall notify the Contracting Officer, in writing, of the name of the individual and the name of an alternate person assigned to the position. The Contracting Officer will notify the Contractor, in writing, of the acceptance of the DQC Plan. After acceptance, any changes proposed by the Contractor are subject to the acceptance of the Contracting Officer.

3.2.3. Content of the CQC Plan.
The CQC plan shall include, as a minimum, the following to cover all design and construction operations, both onsite and offsite, including work by subcontractors, designers of record, consultants, architect/engineer's (A/E's), fabricators, suppliers, and purchasing agents:

3.2.3.1. A description of the quality control organization, including a chart showing lines of authority and acknowledgment that the CQC staff shall implement the three phase control system for all aspects of the work specified. The staff shall include a CQC System Manager who shall report to the project manager or someone higher in the Contractor's organization. Project manager in this context shall mean the individual with responsibility for the overall management of the project including quality and production.

3.2.3.2. The name, qualifications (in resume format), duties, responsibilities, and authorities of each person assigned a CQC function.

3.2.3.3. A copy of the letter to the CQC System Manager signed by an authorized official of the firm which describes the responsibilities and delegates sufficient authorities to
adequately perform the functions of the CQC System Manager, including authority to stop
work which is not in compliance with the contract. The CQC System Manager shall issue letters of direction to all other various quality control representatives outlining duties, authorities, and responsibilities. Copies of these letters will also be furnished to the Government.

3.2.3.4. Procedures for scheduling, reviewing, certifying, and managing submittals, including those of subcontractors, designers of record, consultants, A/E's, off-site
fabricators, suppliers, and purchasing agents. These procedures shall be in accordance with
Section 01330 - SUBMITTAL PROCEDURES.

3.2.3.5. Control, verification, and acceptance testing procedures for each specific test to include the test name, specification paragraph requiring test, feature of work to be tested,
test frequency, and person responsible for each test. (The Contracting Officer must approve
Laboratory facilities.)

3.2.3.6. Procedures for tracking preparatory, initial, and follow-up control phases and control, verification, and acceptance tests including documentation..

3.2.3.7. Procedures for tracking construction deficiencies from identification through acceptable corrective action. These procedures will establish verification that identified deficiencies have been corrected.

3.2.3.8. Reporting procedures, including proposed reporting formats. The Contractor shall utilize a Government-furnished software program titled “RMS” (Resident Management System). See paragraph, IMPLEMENTATION OF GOVERNMENT RESIDENT MANAGEMENT SYSTEM FOR CONTRACTOR QUALITY CONTROL OF CONTRACT, of this section for additional details.

3.2.3.9. A list of the definable features of work. A definable feature of work is a task which is separate and distinct from other tasks, has separate control requirements, and may be identified by different trades or disciplines, or it may be work by the same trade in a different environment. Although each section of the specifications may generally be considered as a definable feature of work, there are frequently more than one definable features under a particular section. This list will be agreed upon during the coordination meeting.

3.2.3.10. A list of tests to be performed shall be furnished as a part of the CQC Plan. The list shall give the test name, frequency, specification paragraph containing the test requirement, the personnel and laboratory responsible for each type of test, and an estimate of the number of tests required.

3.2.3.11. RMS will assist in tracking and reporting for the above requirements. Sample forms generated from the software package shall be used as part of the CQC Plan.

3.2.4. Acceptance of Plan.
Acceptance of the Contractor’s plan is required prior to the start of design and/or construction. Acceptance is conditional and will be predicated on satisfactory performance during the design and construction phases. The Government reserves the right to require the Contractor to make changes in his CQC plan and operations including removal of personnel, as necessary, to obtain the quality specified.

3.2.5 Notification of Changes
After acceptance of the CQC plan, the Contractor shall notify the Contracting Officer in writing a minimum of seven calendar days prior to any proposed change. Proposed changes are subject to acceptance by the Contracting Officer.

3.3. Coordination Meeting.
After the Pre-design Conference, before start of design and/or construction, and prior to acceptance by the Government of the Quality Control Plan, the Contractor shall meet with. the Contracting Officer or Authorized Representative and discuss the Contractor’s quality control system. The CQC Plan shall be submitted for review a minimum of 10 calendar days prior to the Coordination Meeting. During the meeting, a mutual understanding of the system details shall be developed, including the forms for recording the CQC operations, design activities, control activities, testing, administration of the system for both onsite and offsite work, and the interrelationship of Contractor’s Management and control with the Government’s Quality Assurance. Minutes of the meeting shall be prepared by the Government and signed by both the Contractor and the Contracting Officer. The minutes shall become a part of the contract file. There may be occasions when subsequent conferences will be called by either party to reconfirm mutual understandings and/or address deficiencies in the CQC system or procedures which may require corrective action by the Contractor.

3.4. Quality Control Organization.

3.4.1. General.
The requirements for the CQC organization are a CQC System Manager, Designer of Record and sufficient number of additional qualified personnel to ensure contract compliance. The Contractor shall provide a CQC organization, which shall be at the site at all times during progress of the work and which

shall have complete authority to take any action necessary to ensure compliance with the contract. All CQC staff members shall be subject to acceptance by the Contracting Officer.

3.4.2. CQC System Manager.
The Contractor shall identify as CQC System Manager an individual within the on site work organization who shall be responsible for overall management of CQC and have the authority to act in all CQC matters for the Contractor. The CQC System Manager shall be a graduate engineer, graduate architect, or a graduate of construction management, with a minimum of 5 years construction experience on construction similar to this contract. This CQC System Manager shall be on the site at all times during design and construction and shall be employed by the prime Contractor. The CQC System Manager shall be assigned no other duties. An alternate for the CQC System Manager will be identified in the plan to serve in the event of the System Manager's absence. The requirements for the alternate will be the same as for the designated CQC Manager.

3.4.3. CQC Specialist.
In addition to CQC personnel previously specified, the Contractor shall provide as part of the CQC organization specialized personnel to assist the CQC System Manager in the areas listed below. The electrical, mechanical, and submittals clerk specialist shall be directly employed by the prime Contractor. The CQC specialist shall be responsible to the CQC System Manager; be physically present at the construction site during work on their areas of responsibility; have the necessary education and/or experience in accordance with the experience matrix listed herein. These individuals may perform other duties but must be allowed sufficient time to perform their assigned quality control duties as described in the Quality Control Plan.

EXPERIENCE MATRIX-(Example)

Area	Qualifications
Mechanical	Graduate Mechanical Engineer with 2 years experience.
Electrical	Graduate Electrical Engineer with 2 years experience.

3.4.4. Additional Requirement.
In addition to the above experience and education requirements, the CQC System Manager shall have completed the course entitled, "Construction Quality Management for Contractors". The Resident Engineer can arrange for this training.

3.4.5. Organizational Changes.
The Contractor shall obtain Contracting Officer's acceptance before replacing any member of the CQC staff. Requests shall include the names, qualifications, duties, and responsibilities of each proposed replacement. Upon acceptance of any changes, the Contractor shall revise the CQC plan to accurately reflect the changes. The CQC plan shall be kept current at all times during the life of the contract.

3.5. Submittals.
Submittals shall be made as specified in Section 01330 - SUBMITTAL PROCEDURES. The CQC organization shall be responsible for certifying that all submittals are in compliance with the contract requirements.

3.6. Implementation Of Government Resident Management System (RMS) For Contractor Quality Control Of Contract.
The Contractor shall utilize a Government-furnished software program entitled "RMS" (Resident Management System) to maintain critical information needed to manage the project. RMS produces up-to-date management and analysis reports as well as a majority of the forms required in this contract for submission to the Government. One such form is the Daily CQC Reporting System form, which is required to be utilized by the Contractor. This form may be in addition to other Contractor desired

reporting forms. However, all other such reporting forms shall be consolidated into this one Government specified Daily CQC Report Form.

The Contractor will also be required to complete RMS Program Module elements which includes, but is not limited to, Prime Contractor staffing; letter codes; planned cumulative progress earnings; subcontractor information showing trade, name, address, point-of-contact, and insurance expiration dates; definable features of work; pay activity and activity information; required Quality Control tests tied to individual activities; planned User Schooling tied to specific specification paragraphs and contractor activities; Installed Property Listing, Transfer Property Listing and submittal information relating to specification section, description, activity number, review period and expected procurement period. The sum of all activity values shall equal the contract amount, and all Bid Items, Options and Additives shall be separately identified, in accordance with the “Bidding Schedule”. Bid Items may include multiple Activities, but Activities may only be assigned to one such Bid Item. This Module shall be completed to the satisfaction of the Contracting Officer prior to any contract payment (except for Bonds, Insurance and/or Mobilization, as approved by the Contracting Officer) and shall be updated as required.

3.6.1. During the course of the contract, the Contractor will receive various Quality Assurance comments from the Government that will reflect corrections needed to Contractor activities or reflect outstanding or future items needing the attention of the Contractor. The Contractor will acknowledge receipt of these comments by specific number reference on his Daily CQC Report, and will also reflect on his Daily CQC Report when these items are specifically completed or corrected to permit Government verification.

3.6.2. The Contractor’s schedule system shall include, as specific and separate activities, all Preparatory Phase Meetings (inspections); all O&M Manuals; and all Test Plans of Electrical and Mechanical Equipment or Systems that require validation testing or instructions to Government representatives.The following minimum hardware and software requirements are needed by the Contractor to run RMS: A personal computer with Pentium II processor (or higher) and four megabytes (MB) or more of random access memory (RAM), and a 3-1/2 inch high density floppy drive. Also needed is a HP LaserJet Series III printer or later (or compatible), a color monitor, MS-DOS, version 5.0 or later, Word Perfect, version 5.1 or later, and Computer files = 81.

Once the Contract is awarded, the Contractor will be given a copy of the RMS program for implementation. A meeting between the Government and the Contractor will be arranged to inform the Contractor on the use of the software package which is similar to the one the Government will use to manage the project. File updates will be transferred to the Government by disk on a weekly basis, unless electronic transfers are agreed on.

3.7. Control.
Contractor Quality Control is the means by which the Contractor ensures that the design and construction, to include that of the designer of record, consultants, subcontractors and suppliers, complies with the requirements of the contract. At least three phases of control shall be conducted by the CQC System Manager for each definable features of work as follows:

3.7.1. Preparatory Phase
This phase shall be performed prior to beginning work on each definable feature of work, after all required plans/documents/materials are approved/accepted, and after copies are at the work site. This phase shall include:

3.7.1.1. A review of each paragraph of applicable specifications.

3.7.1.2. A review of the contract drawings.

3.7.1.3. A check to assure that all materials and/or equipment have been tested, submitted, and approved.

3.7.1.4. Review of provisions that have been made to provide required control inspection and testing.

3.7.1.5. Examination of the work area to assure that all required preliminary work has been completed and is in compliance with the contract.

3.7.1.6. A physical examination of required materials, equipment, and sample work to assure that they are on hand, conform to approved shop drawings or submitted data, and are properly stored.

3.7.1.7. A review of the appropriate activity hazard analysis to assure safety requirements are met.

3.7.1.8. Discussion of procedures for controlling quality of the work including repetitive deficiencies. Document construction tolerances and workmanship standards for that feature of work.

3.7.1.9. A check to ensure that the portion of the plan for the work to be performed has been accepted by the Contracting Officer.

3.7.1.10. Discussion of the initial control phase.

3.7.1.11. The Government shall be notified at least 72 hours in advance of beginning the preparatory control phase. This phase shall include a meeting conducted by the CQC System Manager and attended by the superintendent, other CQC personnel (as applicable), and the foreman responsible for the definable feature. The results of the preparatory phase actions shall be documented by separate minutes prepared by the CQC System Manager and attached to the daily CQC report. The Contractor shall instruct applicable workers as to the acceptable level of workmanship required in order to meet contract specifications.

3.7.2. Initial Phase
This phase shall be accomplished at the beginning of a definable feature of work. The following shall be accomplished:

3.7.2.1. A check of work to ensure that it is in full compliance with contract requirements.
Review minutes of the preparatory meeting.

3.7.2.2. Verify adequacy of controls to ensure full contract compliance. Verify required control inspection and testing.

3.7.2.3. Establish level of workmanship and verify that it meets minimum acceptable workmanship standards. Compare with required sample panels as appropriate.

3.7.2.4. Resolve all differences.

3.7.2.5. Check safety to include compliance with and upgrading of the safety plan and activity hazard analysis. Review the activity analysis with each worker.

3.7.2.6. The Government shall be notified at least 24 hours in advance of beginning the initial phase. Separate minutes of this phase shall be prepared by the CQC System Manager and attached to the daily CQC report. Exact location of initial phase shall be indicated for future reference and comparison with follow-up phases.

3.7.2.7. The initial phase should be repeated for each new crew to work on site, or any time acceptable specified quality standards are not being met.

3.7.3. Follow-up Phase.
Daily checks shall be performed to assure control activities, including control testing, are providing continued compliance with contract requirements, until completion of the particular feature of work. The checks shall be made a matter of record in the CQC documentation. Final follow-up checks shall be

conducted and all deficiencies corrected prior to the start of additional features of work which may be affected by the deficient work. The Contractor shall not build upon or conceal non-conforming work.

3.7.4. Additional Preparatory and Initial Phases.
Additional preparatory and initial phases shall be conducted on the same definable features of work if the quality of on-going work is unacceptable, if there are changes in the applicable CQC staff, onsite production supervision or work crew, if work on a definable feature is resumed after a substantial period of inactivity, or if other problems develop.

3.8. Tests.

3.8.1. Testing Procedure.
The Contractor shall perform specified or required tests to verify that control measures are adequate to provide a product which conforms to contract requirements. Upon request, the Contractor shall furnish to the Government duplicate samples of test specimens for possible testing by the Government. Testing includes operation and/or acceptance tests when specified. The Contractor shall procure the services of a Corps of Engineers approved testing laboratory or establish an approved testing laboratory at the project site. The Contractor shall perform the following activities and record and provide the following data:

3.8.1.1. Verify that testing procedures comply with contract requirements.

3.8.1.2. Verify that facilities and testing equipment are available and comply with testing standards.

3.8.1.3. Check test instrument calibration data against certified standards.

3.8.1.4. Verify that recording forms and test identification control number system, including all of the test documentation requirements, have been prepared.

3.8.1.5. Results of all tests taken, both passing and failing tests, shall be recorded on the CQC report for the date taken. Specification paragraph reference, location where tests were taken, and the sequential control number identifying the test will be given. If Approved by the Contracting Officer, actual test reports may be submitted later with a reference to the test number and date taken. An information copy of tests performed by an offsite or commercial test facility will be provided directly to the Contracting Officer. Failure to submit timely test reports as stated may result in nonpayment for related work performed and disapproval of the test facility for this contract. The Contractor shall maintain a test log of all tests performed, by type, date, and specification section.

3.8.2 Testing Laboratories

3.8.2.1. Capability Check
The Government reserves the right to check laboratory equipment in the proposed laboratory for compliance with the standards set forth in the contract specifications and to check the laboratory technician’s testing procedures and techniques. Laboratories utilized for testing soils, concrete, asphalt, and steel shall meet criteria detailed in ASTM D 3740 and ASTM E 329.

3.8.2.2. Capability Recheck
If the selected laboratory fails the capability check, the Contractor will be assessed a charge of $1,000.00 to reimburse the Government for each succeeding recheck of the laboratory or the checking of a subsequently selected laboratory. Such costs will be deducted from the contract amount due the Contractor.

3.8.3. On Site Laboratory.
The Government reserves the right to utilize the Contractor’s control testing laboratory and equipment to make assurance tests and to check the Contractor’s testing procedures, techniques, and test results at no additional cost to the Government.

3.8.4. Furnishing or Transportation of Samples for Testing Costs incidental to the transportation of samples or materials shall be borne by the Contractor. Samples of materials for test verification and acceptance testing by the Government shall be delivered to the Corps of Engineers Laboratory, f.o.b., at the following address:

For delivery by mail and for other deliveries:
Commander, U.S. Army Engineer Waterways Experiment Station
ATTN: CEWES-SC
3909 Halls Ferry Road
Vicksburg, Mississippi 39180-6199
Coordination for each specific test, exact delivery location, and dates will be made through the Area Office.

3.9. Completion Inspection.

3.9.1. Punch-Out Inspection.

Near the completion of all work or any increment thereof established by a completion time stated in the Special Clause entitled “Commencement, Prosecution, and Completion of Work,” or stated elsewhere in the specifications, the CQC System Manager shall conduct an inspection of the work and develop a punch list of items which do not conform to the. approved drawings and specifications. Such a list of deficiencies shall be included in the CQC documentation, as required by paragraph DOCUMENTATION below, and shall include the estimated date by which the deficiencies will be corrected. The CQC System Manager or staff shall make a second inspection to ascertain that all deficiencies have been corrected. Once this is accomplished, the Contractor shall notify the Government that the facility is ready for the Government Pre-Final inspection.

3.9.2. Pre-Final Inspection.
The Government will perform this inspection to verify that the facility is complete and ready to be occupied. A Government Pre-Final Punch List may be developed as a result of this inspection. The Contractor’s CQC System Manager shall ensure that all items on this list have been corrected before notifying the Government so that a Final inspection with the customer can be scheduled. Any items noted on the Pre-Final inspection shall be corrected in a timely manner. These inspections and any deficiency corrections required by this paragraph shall be accomplished within the time slated for completion of the entire work or an particular increment thereof if the project is divided into increments by separate completion dates.

3.9.3. Final Acceptance Inspection.
The Contractor’s Quality Control Inspection personnel, plus the superintendent or other primary management person, and the Contracting Officer’s Representative shall be in attendance at this inspection. Additional Government personnel including, but not limited to, those from Base/Post Civil Facility Engineer user groups, and major commands may also be in attendance. The final acceptance inspection will be formally scheduled by the Contracting Officer based upon results of the Pre-Final inspection. Notice shall be given to the Contracting Officer at least 14 days prior to the final acceptance inspection and shall include the Contractor’s assurance that all specific items previously identified to the Contractor as being unacceptable, along with all remaining work performed under the contract, will be complete and acceptable by the date scheduled for the final acceptance inspection. Failure of the Contractor to have all contract work acceptably complete for this inspection will be cause for the Contracting Officer to bill the Contractor for the Government’s additional inspection cost in accordance with the contract clause titled “Inspection of Construction”.

3.9.4. Post Completion Feedback Meeting and Preparation of Written Minutes.
At the completion of this project, the CQC Systems Manager will host a meeting to review the project and to discuss lessons learned during the construction of the project. This meeting should be scheduled for 4 hours on-site and should be attended by the Project Manager and representatives of the major

subcontractors, including mechanical and electrical. The Contracting Officer will invite members of the design team to participate in this meeting.

3.10. Documentation.
The Contractor shall maintain current records providing factual evidence that required quality control activities and/or tests have been performed. These records shall include the work of subcontractors and suppliers and shall be on an acceptable form that includes, as a minimum, the following information:

3.10.1. Contractor/subcontractor and their area of responsibility.

3.10.2. Operating plant/equipment with hours worked, idle, or down for repair.

3.10.3. Work performed each day, giving location, description, and by whom. When Network Analysis (NAS) is used, identify each phase of work performed each day by NAS activity number.

3.10.4. Test and/or control activities performed with results and references to specifications/drawings requirements. The control phase should be identified (Preparatory, Initial, Follow-up). List deficiencies noted along with corrective action.

3.10.5. Quantity of materials received at the site with statement as to acceptability, storage, and reference to specifications/drawings requirements.

3.10.6. Submittals reviewed, with contract reference, by whom, and action taken.

3.10.7. Offsite surveillance activities, including actions taken.

3.10.8. Job safety evaluations stating what was checked, results, and instructions or corrective actions.

3.10.9. Instructions given/received and conflicts in plans and/or specifications.

3.10.10. Contractor’s verification statement.
These records shall indicate a description of trades working on the project; the number of personnel working; weather conditions encountered; and any delays encountered. These records shall cover both conforming and deficient features and shall include a statement that equipment and materials incorporated in the work and workmanship comply with the contract. The original and one copy of these records in report form shall be furnished to the Government daily within 12 hours after the date covered by the report, except that reports need not be submitted for days on which no work is performed. As a minimum, one report shall be prepared and submitted for every 7 days of no work and on the last day of a no work period. All calendar days shall be accounted for throughout the life of the contract. The first report following a day of no work shall be for that day only. Reports shall be signed and dated by the CQC System Manager. The report from the CQC System Manager shall include copies of test reports and copies of reports prepared by all subordinate quality control personnel.

3.10.11. Correspondence.
The Contractor shall establish and implement a serialized numbering system for letters sent to the Government. The numbering system shall identify the contract number and shall progress sequentially starting with the number one (1) and continuing thereafter without break in numbering. All letters sent to the Government shall include a subject heading which identifies the Contract Clause Number, Special Clause Number, or Technical Provision Number, and the particular subject item addressed by the letter.

3.11. Sample Forms.
Sample forms are enclosed at the end of this section as follows:

3.11.1. Minimum Daily Construction Quality Control Report and the required preparatory and initial inspection documentation.

3.11.2. All tests of piping systems or portions thereof shall be recorded on the “Piping System Test Report”.

3.11.3. Roofing operations, including materials used, shall be reported on “CONTRACTOR’S INSPECTOR ROOFING CHECK LIST AND TEST REPORT”.

3.11.4. When operation and maintenance instructions for equipment are given to Government representatives by the Contractor, his representative shall record on a form similar to that attached hereto, the applicable data, including the name, organization and signature of each person attending the instructions. All tests on engine-generator sets shall be recorded on “Appendix A” and “Appendix B” forms.

3.11.5. Paint service records documented on ENG Form 144, “Paint Service Record”, a copy of which is attached hereto, shall be maintained by the Contractor for each pint formulation used on metal structures (maintenance or new work, other than minor trim items,), and for each paint formulation applied by the manufacturer on prefinished metal products. Paint service records shall be furnished to the Contracting Officer on a weekly basis.

3.12. Notification Of Noncompliance.
The Contracting Officer will notify the Contractor of any detected noncompliance with the foregoing requirements. The Contractor shall take immediate corrective action after receipt of such notice. Such notice, when delivered to the Contractor at the work site, shall be deemed sufficient for the purpose of notification. If the Contractor fails or refuses to comply promptly, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to such stop orders shall be made the subject of claim for extension of time or for excess costs or damages by the Contractor.

SECTION TABLE OF CONTENTS

DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01572

CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT

-- End of Section Table of Contents --

SECTION 01572

CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT

PART 1 GENERAL

1.1 DEFINITIONS

1.1.1 Construction and Demolition Debris

Solid waste, largely inert waste, resulting from the demolition or razing of buildings, of roads, or other structures. Construction and demolition waste does not include cleanup materials contaminated with hazardous substances, friable asbestos, waste paints, solvents, sealers, adhesives, or similar materials as determined by the Contracting Officer.

1.1.2 Recyclable Materials

Products and materials that can be recovered and remanufactured into a new product. Some of the recyclable materials may include, but are not limited to, the following:

a. Metals (ferrous and non-ferrous), including banding, metal studs, ductwork, piping

b. Asphaltic concrete paving

c. Portland cement concrete

d. Land clearing debris including trees and plant materials

e. Native rock and granular fill

f. Gypsum products

g. Paper and cardboard

h. Wood products, including structural, finish, crates and pallets

i. Brick and masonry

j. Carpet and padding

k. Plastics

l. Copper wiring

m. Mechanical and electrical products and equipment

1.1.3 Recycling Facility

A business that specializes in collecting, handling, processing, distributing, or remanufacturing waste materials generated by demolition and new construction projects, into products or materials that can be used for this project or by others. The business must have the necessary

permits as stated herein and any other permits as required by the local, State, and Federal Government.

1.1.4 Salvage and Reuse

Existing usable product or material that can be saved and reused in some manner on the project site. Materials that can be salvaged and reused must comply with the applicable technical specifications.

1.1.5 Salvage for Resale

Existing usable transported to landfills for disposal, that are product or material that can be saved and removed intact (as is) from the project site to another site for resale to others without remanufacturing.

1.1.6 Trash

Product or material transported to landfills for disposal, that are unable to be salvaged for resale, salvaged and reused, returned, recycled, or burned for energy recovery.

1.1.7 Waste Materials

Product or material that have the potential to be salvaged for resale, salvaged and reused, returned to vendors, or recycled.

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-07 Certificates

Construction Waste Management Plan

Recycling Facility Permits

Recycling Facility Permit from the State of Hawaii, Department of Health Office Solid Waste Management, to operate a recycling facility.

Permit from the City and County of Honolulu Department of Planning, to operate a solid waste transfer station

1.3 CONSTRUCTION WASTE MANAGEMENT

1.3.1 General

a. Unless otherwise directed by the Contracting Officer, reference to recycling, salvage, or reuse in all technical specifications shall be superceded by this specification.

b. The Contractor shall use all means available to recycle mandatory items. All other debris shall be recycled to the greatest extent practical and economically feasible to divert construction and demolition waste from landfills. Revenues and other savings generated

by the waste management program shall belong to the Contractor.

1.3.2 Construction Waste Management Operations

The Contractor shall manage construction waste and require all subcontractors, vendors, and suppliers to participate in the effort. The Contractor shall establish a construction waste management program that includes the following categories:

a. Minimizing Packaging Materials

b. Salvage and reuse: First consideration shall be given to salvage for reuse since little or no re-processing is necessary and less pollution is created when items are reused in their original form. Reuse may be on or off-site. The contractor shall ensure appropriate permits are provided for off-site use, where applicable.

c. Salvage for resale or donation: Sale or donation of salvaged material suitable for reuse shall be considered. Salvaged materials, other than those specified for reinstallation, shall not be used in this projects or sold on-site.

d. Recycling: Waste materials that cannot be salvaged and reused, but have value as being recyclable, shall be recycled. The Contractor shall be responsible for implementation of any special programs involving rebates or similar incentives related to recycling construction waste for this project.

e. Disposal: Waste materials with no practical use or economic benefit shall be designated as trash and transported to a landfill for disposal.

Waste materials that cannot be salvaged and reused, and have value as being recyclable, shall be recycled. Only trash shall be transported to a landfill. The Contractor shall be responsible for implementation of any special programs involving rebates or similar incentives related to recycling construction waste for this project.

1.3.3 Waste Management Plan

The Contractor shall perform a site visit to determine the types and quantity of construction waste anticipated and identify salvage for resale, salvage and reuse, recycling and disposal options available. Within 30 days after contract award and prior to performing any work, the contractor shall submit a Waste Management Plan for review and acceptance. Physical work that generates any waste material shall not commence until Waste Management Plan is accepted by the Government. The Waste Management Plan shall at a minimum include the following:

a. Contractor and project identification information

b. Name of individuals on the Contractor's staff responsible for waste prevention and management.

c. Types of solid resource materials and wastes that will be produced (example Waste Management Plan and Tracking form attached to the end of this section).

d. Materials to be salvaged, reused, and recycled, both on-site and off-site

e. Procedures to be used such as:

(1) Actions that will be taken to reduce trash.

(2) Description of the specific procedures to be used in recycling/reuse of the various materials generated

(3) Areas and equipment to be used for processing, sorting, and temporary storage of wastes.

(4) On-site concrete and asphalt crushing for use on-site, etc.

f. Characterization, including estimated types and quantities, of the waste to be generated(mandatory recyclables and other products the Contractor deems appropriate).

g. Names and locations of salvage, reuse, recycling facilities/sites and permits.

h. Names and locations of trash disposal facilities/sites

i. Identification of trash materials under this contract.

Contractor shall revise and resubmit when required the Waste Management Plan to incorporate review comments by the Contracting Officer. Contracting Officer's acceptance of the Waste Management Plan is conditional and will not otherwise relieve the Contractor of responsibility for adequate and continuing control of pollutants and other environmental protection measures. The Government reserves the right to require the Contractor to update and incorporate revisions, during the course of the construction, into the plan as determined by the Contracting Officer.

1.3.4 Hazardous and Toxic Waste

Hazardous and Toxic wastes shall not be included as demolition and construction debris. All hazardous and toxic waste materials shall be removed prior to demolition in accordance with applicable sections of the technical specification.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION

3.1 PROGRAM IMPLEMENTATION AND MONITORING

The Contractor shall implement and maintain, for the duration of the project, the construction waste management program. The Contractor shall establish a reporting worksheet to monitor and document the program. Contractor shall complete a Waste Management Tracking Form (sample form attached to the end of this Section) on a monthly basis as described below:

a. Fill in the project title; contract number; name and address of company submitting the Tracking Form; the printed name, signature, and daytime phone number of (FAX if available) the person completing the form; the beginning and ending dates of the period covered; and the date that the form is completed.

b. Report disposal/recycling either in tons or in cubic yards (tons preferred). Indicate zero (0) if there is no quantity to report for a type of material.

c. Indicate locations to which materials are delivered.

d. Attach to the form legible copies of weigh tickets, receipts, invoices, or other documents that specifically identify the Project generating the materials. Said documents must be from sites and/or facilities that can legally accept the materials for purposes of reuse, recycling, or disposal.

e. Calculate a running total of all reuse, salvage, recycle and trash streams. Also calculate a total percent of reuse, salvage and recycle streams and the total percentage of trash disposed.

Failure to complete monthly tracking forms shall be cause for withholding any payment due the Contractor under this contract.

3.2 HAZARDOUS MATERIAL/HAZARDOUS WASTES

The Contractor shall notify the Contracting Officer, if any non-acceptable materials such as hazardous materials or hazardous wastes are encountered during removal and separation.

3.3 MANDATORY MATERIALS

Mandatory Materials shall be recycled.

3.4 SALVAGE AND REUSE

a. The Contractor shall encourage the practice of efficient waste management when, sizing, cutting, and installing products and materials.

b. Soil and satisfactory fill reused on site shall also be a part of Construction and Demolition Waste Management Program and shall be indicated on the Waste Management Plan and on the Tracking Forms.

3.5 SEPARATION OF RECYCLABLE WASTE MATERIALS

The Contractor shall provide the necessary on-site containers and/or bins, to effectively facilitate the Construction and Demolition Waste Management Program. The container/bins shall be clearly and appropriately marked. The Contractor shall separate construction and demolition waste by one or a combination of the following methods:

a. Source Separation Method: Waste products and materials that are recyclable shall be separated from trash and sorted into approximately marked separate containers and then transported to the respective recycling facility for further processing. Trash shall be transported to a landfill for disposal.

b. Co-Mingled Method: All construction waste is placed into a single container and then transported to a recycling facility where the recyclable materials are sorted and processed. Processing includes separation for energy recovery. The remaining trash shall be transported to a landfill for disposal.

c. Other methods proposed by the Contractor and approved by the Contracting Officer.

-- End of Section --

SECTION TABLE OF CONTENTS

DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01780

CLOSEOUT SUBMITTALS

-- End of Section Table of Contents --

SECTION 01780

CLOSEOUT SUBMITTALS

PART 1 GENERAL

1.1 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

As-Built Drawings.

Drawings showing final as-built conditions of the project. The final CADD as-built drawings shall consist of one set of electronic CADD drawing files in the specified format, one set of original drawings, 2 sets of prints of the originals, and one set of the Government accepted working as-built drawings.

SD-03 Product Data

As-Built Record of Equipment and Materials.

Two copies of the record listing the as-built materials and equipment incorporated into the construction of the project.

Warranty Management Plan.

One set of the warranty management plan containing information relevant to the warranty of materials and equipment incorporated into the construction project, including the starting date of warranty of construction. The Contractor shall furnish with each warranty the name, address, and telephone number of each of the guarantor's representatives nearest to the project location.

Warranty Tags.

Two record copies of the warranty tags showing the layout and design.

Final Clean-Up.

Two copies of the listing of completed final clean-up items.

1.2 PROJECT RECORD DOCUMENTS

1.2.1 As-Built Drawings

This paragraph covers as-built drawings complete, as a requirement of the

contract. The terms "drawings," "contract drawings," "drawing files," "working as-built drawings" and "final as-built drawings" refer to contract drawings which are revised to be used for final as-built drawings.

1.2.1.1 Government Furnished Materials

One set of electronic CADD files in the specified software and format revised to reflect all bid amendments will be provided by the Government at the preconstruction conference for projects requiring CADD file as-built drawings.

1.2.1.2 Working As-Built and Final As-Built Drawings

The Contractor shall maintain 2 sets of paper drawings by red-line process to show the as-built conditions during the prosecution of the project. These working as-built marked drawings shall be kept current on a daily basis and at least one set shall be available on the jobsite at all times. Changes from the contract plans which are made in the work or additional information which might be uncovered in the course of construction shall be accurately and neatly recorded as they occur by means of details and notes. At the final inspection or upon beneficial occupancy of the facility by the user, whichever comes first. The Contractor shall provide one of the two sets of working as-built drawings to the COR for turnover with the facility. This set will serve as an advance/interim working set for the occupant of the completed facility; until such time that the final as-built drawings are furnished to them. Final as-built drawings shall be prepared after the completion of each definable feature of work as listed in the Contractor Quality Control Plan (Foundations, Utilities, Structural Steel, etc., as appropriate for the project). The working as-built marked drawings and final as-built drawings will be jointly reviewed for accuracy and completeness by the Contracting Officer and the Contractor prior to submission of each monthly pay estimate. If the Contractor fails to maintain the working and final as-built drawings as specified herein, the Contracting Officer will deduct from the monthly progress payment an amount representing the estimated cost of maintaining the as-built drawings. This monthly deduction will continue until an agreement is reached between the Contracting Officer and the Contractor regarding the accuracy and completeness of updated drawings. The working and final as-built drawings shall show, but shall not be limited to, the following information:

a. The actual location, kinds and sizes of all sub-surface utility lines. In order that the location of these lines and appurtenances may be determined in the event the surface openings or indicators become covered over or obscured, the as-built drawings shall show, by offset dimensions to two permanently fixed surface features, the end of each run including each change in direction. Valves, splice boxes and similar appurtenances shall be located by dimensioning along the utility run from a reference point. The average depth below the surface of each run shall also be recorded.

b. The location and dimensions of any changes within the building structure.

c. Correct grade, elevations, cross section, or alignment of roads, earthwork, structures or utilities if any changes were made from contract plans.

d. Changes in details of design or additional information obtained from working drawings specified to be prepared and/or furnished by the Contractor; including but not limited to fabrication, erection,

installation plans and placing details, pipe sizes, insulation material, dimensions of equipment foundations, etc.

e. The topography, invert elevations and grades of drainage installed or affected as part of the project construction.

f. Changes or modifications which result from the final inspection.

g. Where contract drawings or specifications present options, only the option selected for construction shall be shown on the final as-built drawings.

h. If borrow material for this project is from sources on Government property, or if Government property is used as a spoil area, the Contractor shall furnish a contour map of the final borrow pit/spoil area elevations.

i. Systems designed or enhanced by the Contractor, such as HVAC controls, fire alarm, fire sprinkler, and irrigation systems.

j. Modifications (change order price shall include the Contractor's cost to change working and final as-built drawings to reflect modifications) and compliance with the following procedures.

(1) Directions in the modification for posting descriptive changes shall be followed.

(2) A Modification Circle shall be placed at the location of each deletion.

(3) For new details or sections which are added to a drawing, a Modification Circle shall be placed by the detail or section title.

(4) For minor changes, a Modification Circle shall be placed by the area changed on the drawing (each location).

(5) For major changes to a drawing, a Modification Circle shall be placed by the title of the affected plan, section, or detail at each location.

(6) For changes to schedules or drawings, a Modification Circle shall be placed either by the schedule heading or by the change in the schedule.

(7) The Modification Circle size shall be 1/2 inch diameter unless the area where the circle is to be placed is crowded. Smaller size circle shall be used for crowded areas.

1.2.1.3 Drawing Preparation

The as-built drawings shall be modified as may be necessary to correctly show the features of the project as it has been constructed by bringing the contract set into agreement with Government accepted working as-built drawings, and adding such additional drawings as may be necessary. These working as-built marked drawings shall be neat, legible and accurate. These drawings are part of the permanent records of this project and shall be returned by the Contractor to the Contracting Officer after final acceptance by the Government. Any drawings damaged or lost by the Contractor shall be satisfactorily replaced by the Contractor at no expense to the Government.

1.2.1.4 Computer Aided Design and Drafting (CADD) Drawings

Only personnel proficient in the preparation of microstation CADD drawings shall be employed to modify the contract drawings or prepare additional new drawings. Additions and corrections to the contract drawings shall be equal in quality and detail to that of the originals. Line colors, line weights, lettering, layering conventions, and symbols shall be the same as the original line colors, line weights, lettering, layering conventions, and symbols. If additional drawings are required, they shall be prepared using the specified electronic file format applying the same graphic standards specified for original drawings. The title block and drawing border to be used for any new final as-built drawings shall be identical to that used on the contract drawings. Additions and corrections to the contract drawings shall be accomplished using CADD files. The Contractor will be furnished Microstation CADD files and pentable. The electronic files will be supplied on compact disc, read-only memory (CD-ROM). The Contractor shall be responsible for providing all program files and hardware necessary to prepare final as-built drawings. The Contracting Officer will review final as-built drawings for accuracy and the Contractor shall make required corrections, changes, additions, and deletions.

a. CADD colors shall be the "base" colors of red, green, and blue. Color code for changes shall be as follows:

(1) Deletions (red) - Deleted graphic items (lines) shall be colored red with red lettering in notes and leaders.

(2) Additions (Green) - Added items shall be drawn in green with green lettering in notes and leaders.

(3) Special (Blue) - Items requiring special information, coordination, or special detailing or detailing notes shall be in blue.

b. All changes to the contract drawing files shall be made on the level as the original item. There shall be no deletions of existing lines; existing lines shall be over struck in red. Additions shall be in green with line weights the same as the drawing.

c. When final revisions have been completed, the cover sheet drawing shall show the wording "RECORD DRAWING AS-BUILT" followed by the name of the Contractor in letters at least 3/16 inch high. All other contract drawings shall be marked either "as-built" drawing denoting no revisions on the sheet or "Revised As-Built" denoting one or more revisions. Original contract drawings shall be dated in the revision block.

d. Within 10 days after Government acceptance of all of the working as-built drawings for a phase of work, the Contractor shall prepare the final CADD as-built drawings for that phase of work and submit two sets of blue/black-line prints of these drawings for Government review. The Government will promptly return one set of prints annotated with any necessary corrections. Within 10 days the Contractor shall revise the CADD files accordingly at no additional cost and submit one set of final prints for the completed phase of work to the Government. Within 10 days of substantial completion of all phases of work, the Contractor shall submit the final as-built drawing package for the entire project. The submittal shall consist of one set of electronic files on compact disc, read-only memory (CD-ROM), one set of originals, two sets of prints and one set of

the Government annotated and accepted working as-built drawings. They shall be complete in all details and identical in form and function to the contract drawing files supplied by the Government. Any transactions or adjustments necessary to accomplish this is the responsibility of the Contractor. The Government reserves the right to reject any drawing files it deems incompatible with the customer's CADD system. Paper prints, drawing files and storage media submitted will become the property of the Government upon final acceptance. Failure to submit final as-built drawing files or working as-built marked drawings as specified shall be cause for withholding any payment due the Contractor under this contract. Acceptance of final as-built drawings shall be accomplished before final payment is made to the Contractor.

1.2.1.5 Payment

No separate payment will be made for as-built drawings required under this contract, and all costs accrued in connection with such drawings shall be considered a subsidiary obligation of the Contractor.

1.2.2 As-Built Record of Equipment and Materials

The Contractor shall furnish one copy of preliminary record of equipment and materials used on the project 15 days prior to final inspection. This preliminary submittal will be reviewed and returned 2 days after final inspection with Government comments. Two sets of final record of equipment and materials shall be submitted 10 days after final inspection. The designations shall be keyed to the related area depicted on the contract drawings. The record shall list the following data:

RECORD OF DESIGNATED EQUIPMENT AND MATERIALS DATA

Description	Specification Section	Manufacturer and Catalog, Model, and Serial Number	Composition and Size	Where Used

1.2.3 Final Approved Shop Drawings

The Contractor shall furnish final approved project shop drawings 30 days after transfer of the completed facility.

1.2.4 Real Property Equipment

The Contractor shall furnish a list of installed equipment furnished under this contract. The list shall include all information usually listed on manufacturer's name plate. The "EQUIPMENT-IN-PLACE LIST" shall include, as applicable, the following for each piece of equipment installed: description of item, location (by room number), model number, serial number, capacity, name and address of manufacturer, name and address of equipment supplier, condition, spare parts list, manufacturer's catalog, and warranty. A draft list shall be furnished at time of transfer. The final list shall be furnished 30 days after transfer of the completed facility.

1.3 WARRANTY MANAGEMENT

1.3.1 Warranty Management Plan

The Contractor shall develop a warranty management plan. At least 30 days

before the planned pre-warranty conference, the Contractor shall submit the warranty management plan for Government approval. The warranty management plan shall include all required actions and documents to assure that the Government receives all warranties to which it is entitled, in accordance with the Contract Clause, WARRANTY OF CONSTRUCTION. The plan shall be in narrative form and contain sufficient detail to render it suitable for use by future maintenance and repair personnel, whether tradesmen, or of engineering background, not necessarily familiar with this contract. The term "status" as indicated below shall include due date and whether item has been submitted or was accomplished. Warranty information made available during the construction phase shall be submitted to the Contracting Officer for approval prior to each monthly pay estimate. Approved information shall be assembled in a binder and shall be turned over to the Government upon acceptance of the work. The construction warranty period shall begin on the date of project acceptance and shall continue for the full product warranty period. A joint 4 month and 9 month warranty inspection shall be conducted, measured from time of acceptance, by the Contractor, Contracting Officer and the Customer Representative. Information contained in the warranty management plan shall include, but shall not be limited to, the following:

a. Roles and responsibilities of all personnel associated with the warranty process, including points of contact and telephone numbers within the organizations of the Contractors, subcontractors, manufacturers or suppliers involved.

b. Listing and status of delivery of all Certificates of Warranty for extended warranty items, to include roofs, HVAC balancing, pumps, motors, transformers, and for all commissioned systems such as fire protection and alarm systems, sprinkler systems, lightning protection systems, etc.

c. A list for each warranted equipment, item, feature of construction or system indicating:

1. Name of item.
2. Model and serial numbers.
3. Location where installed.
4. Name and phone numbers of manufacturers or suppliers.
5. Names, addresses and telephone numbers of sources of spare parts.
6. Warranties and terms of warranty. This shall include one-year overall warranty of construction. Items which have extended warranties shall be indicated with separate warranty expiration dates.
7. Cross-reference to warranty certificates as applicable.
8. Starting point and duration of warranty period.
9. Summary of maintenance procedures required to continue the warranty in force.
10. Cross-reference to specific pertinent Operation and Maintenance manuals.
11. Organization, names and phone numbers of persons to call for warranty service.
12. Typical response time and repair time expected for various warranted equipment.

d. The Contractor's plans for attendance at the 4 and 9 month post-construction warranty inspections conducted by the Government.

e. Procedure and status of tagging of all equipment covered by

extended warranties.

f. Copies of instructions to be posted near selected pieces of equipment where operation is critical for warranty and/or safety reasons.

1.3.2 Performance Bond

The Contractor's Performance Bond shall remain in effect throughout the construction period, and during the life of any guaranty required under the Contract Performance Bond, Standard Form 25.

a. In the event sufficient funds are not available to cover the construction warranty work performed by the Government, at the Contractor's expense, the Contracting Officer will have the right to recoup expenses from the bonding company.

b. Following oral or written notification of required construction warranty repair work, the Contractor shall respond in a timely manner. Written verification will follow oral instructions. Failure of the Contractor to respond will be cause for the Contracting Officer to proceed against the Contractor.

1.3.3 Pre-Warranty Conference

Prior to contract completion, and at a time designated by the Contracting Officer, the Contractor shall meet with the Contracting Officer to develop a mutual understanding with respect to the requirements of this section. Communication procedures for Contractor notification of construction warranty defects, priorities with respect to the type of defect, reasonable time required for Contractor response, and other details deemed necessary by the Contracting Officer for the execution of the construction warranty shall be established/reviewed at this meeting. In connection with these requirements and at the time of the Contractor's quality control completion inspection, the Contractor shall furnish the name, telephone number and address of a licensed and bonded company which is authorized to initiate and pursue construction warranty work action on behalf of the Contractor. This point of contact will be located within the local service area of the warranted construction, shall be continuously available, and shall be responsive to Government inquiry on warranty work action and status. This requirement does not relieve the Contractor of any of its responsibilities in connection with other portions of this provision.

1.3.4 Contractor's Response to Construction Warranty Service Requirements

Following oral or written notification by the Contracting Officer, the Contractor shall respond to construction warranty service requirements in accordance with the "Construction Warranty Service Priority List" and the three categories of priorities listed below. The Contractor shall submit a report on any warranty item that has been repaired during the warranty period. The report shall include the cause of the problem, date reported, corrective action taken, and when the repair was completed. If the Contractor does not perform the construction warranty within the timeframes specified, the Government will perform the work and backcharge the construction warranty payment item established.

a. First Priority Code 1. Perform onsite inspection to evaluate situation, and determine course of action within 4 hours, initiate work within 6 hours and work continuously to completion or relief.

b. Second Priority Code 2. Perform onsite inspection to evaluate situation, and determine course of action within 8 hours, initiate work within 24 hours and work continuously to completion or relief.

c. Third Priority Code 3. All other work to be initiated within 3 work days and work continuously to completion or relief.

d. The "Construction Warranty Service Priority List" is as follows:

Code 1-Air Conditioning Systems
(1) Recreational support.
(2) Air conditioning leak in part of building, if causing damage.
(3) Air conditioning system not cooling properly.

Code 1-Doors
(1) Overhead doors not operational, causing a security, fire, or safety problem.
(2) Interior, exterior personnel doors or hardware, not functioning properly, causing a security, fire, or safety problem.

Code 3-Doors
(1) Overhead doors not operational.
(2) Interior/exterior personnel doors or hardware not functioning properly.

Code 1-Electrical
(1) Power failure (entire area or any building operational after 1600 hours).
(2) Security lights
(3) Smoke detectors

Code 2-Electrical
(1) Power failure (no power to a room or part of building).
(2) Receptacle and lights (in a room or part of building).

Code 3-Electrical
Street lights.

Code 1-Gas
(1) Leaks and breaks.
(2) No gas to family housing unit or cantonment area.

Code 1-Heat
(1) Area power failure affecting heat.
(2) Heater in unit not working.

Code 2-Kitchen Equipment
(1) Dishwasher not operating properly.
(2) All other equipment hampering preparation of a meal.

Code 1-Plumbing
(1) Hot water heater failure.
(2) Leaking water supply pipes.

Code 2-Plumbing
(1) Flush valves not operating properly.
(2) Fixture drain, supply line to commode, or any water pipe leaking.
(3) Commode leaking at base.

Code 3 -Plumbing
Leaky faucets.

Code 3-Interior
(1) Floors damaged.
(2) Paint chipping or peeling.
(3) Casework.

Code 1-Roof Leaks
Temporary repairs will be made where major damage to property is occurring.

Code 2-Roof Leaks
Where major damage to property is not occurring, check for location of leak during rain and complete repairs on a Code 2 basis.

Code 2-Water (Exterior)
No water to facility.

Code 2-Water (Hot)
No hot water in portion of building listed.

Code 3-All other work not listed above.

1.3.5 Warranty Tags

At the time of installation, each warranted item shall be tagged with a durable, oil and water resistant tag approved by the Contracting Officer. Each tag shall be attached with a copper wire and shall be sprayed with a silicone waterproof coating. The date of acceptance and the QC signature shall remain blank until project is accepted for beneficial occupancy. The tag shall show the following information.

a. Type of product/material_____.

b. Model number_____.

c. Serial number_____.

d. Contract number_____.

e. Warranty period_____from_____to_____.

f. Inspector's signature_____.

g. Construction Contractor_____.

Address_____.

Telephone number_____.

h. Warranty contact_____.

Address_____.

Telephone number_____.

i. Warranty response time priority code_____.

j. WARNING - PROJECT PERSONNEL TO PERFORM ONLY OPERATIONAL MAINTENANCE DURING THE WARRANTY PERIOD.

1.4 MECHANICAL TESTING, ADJUSTING, BALANCING, AND COMMISSIONING

Prior to final inspection and transfer of the completed facility; all reports, statements, certificates, and completed checklists for testing, adjusting, balancing, and commissioning of mechanical systems shall be submitted to and approved by the Contracting Officer as specified in applicable technical specification sections.

1.5 OPERATION AND MAINTENANCE MANUALS

Operation manuals and maintenance manuals shall be submitted as specified. Operation manuals and maintenance manuals provided in a common volume shall be clearly differentiated and shall be separately indexed.

1.6 FINAL CLEANING

The premises shall be left broom clean. Stains, foreign substances, and temporary labels shall be removed from surfaces. Carpet and soft surfaces shall be vacuumed. Equipment and fixtures shall be cleaned to a sanitary condition. Filters of operating equipment shall be cleaned. Debris shall be removed from roofs, drainage systems, gutters, and downspouts. Paved areas shall be swept and landscaped areas shall be raked clean. The site shall have waste, surplus materials, and rubbish removed. The project area shall have temporary structures, barricades, project signs, and construction facilities removed. A list of completed clean-up items shall be submitted on the day of final inspection.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

-- End of Section --